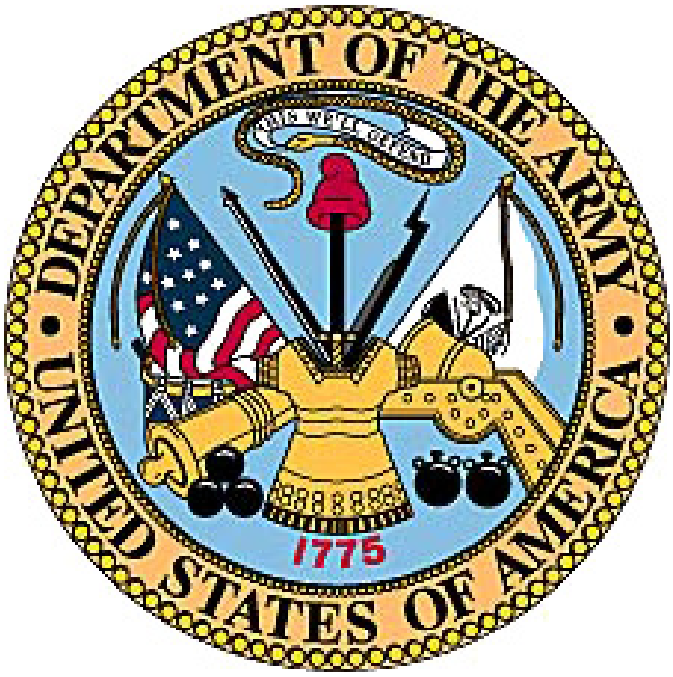
Programmatic Environmental Assessment

for

Standard Targetry Replacement



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FINDING OF NO SIGNIFICANT IMPACT
STANDARD TARGETRY REPLACEMENT
HEADQUARTERS, DEPARTMENT OF THE ARMY
DEPUTY CHIEF OF STAFF, G-3
DIRECTORATE OF TRAINING
TRAINING SIMULATIONS DIVISION (DAMO-TRS)

1.0 TITLE OF ACTION

Programmatic Environmental Assessment for Standard Targetry Replacement

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

This Programmatic Environmental Assessment (PEA) will establish a benchmark for evaluating standard targetry replacement under the National Environmental Policy Act (NEPA). When maintenance of targetry ranges is planned, installation staff will consider whether it qualifies as standard targetry replacement and therefore covered by this PEA. If proposed range maintenance activities fit the definition of standard targetry replacement, a Record of Environmental Consideration (REC) citing this PEA may be prepared to complete the NEPA documentation.

2.2 No Action Alternative

Under the No Action Alternative, the installation, major command, or installation management agency region would continue evaluating standard targetry replacement for potential impacts to the human and natural environment on an individual or installation-specific basis. A comprehensive review process for all standard targetry replacement actions is not established. The time required to complete planned targetry maintenance may be significantly longer than under the proposed action. Compared to the Proposed Action, the No Action Alternative does not allow for use of a Categorical Exclusion or a REC citing the PEA for Standard Targetry Replacement. Nor does it allow for re-use of applicable parts of the PEA and a tiered analysis to address site-specific or action-specific training to support the evolution of changing tactics, doctrine, and weapon systems that help ensure soldier readiness. This results in unnecessary time delays, duplication of analyses associated with environmental consequences associated with targetry maintenance/replacement on various environmental resources, and expenditure of unnecessary funding.

3.0 SUMMARY OF ENVIRONMENTAL EFFECTS

No significant cumulative adverse impacts to the human or natural environment are anticipated from implementation of the proposed action. Implementation of the proposed action will support standard targetry replacement as an activity that can be categorically excluded by being covered in this PEA.

4.0 PUBLIC INVOLEMENT

A Notice of Availability (NOA) for the draft Finding of No Significant Impact (FNSI) was published in USA Today on 21 February 2006. The FNSI and supporting PEA were available through the US Army Environmental Center Public Affairs Office and through the USAEC website for 30 days following publication of the NOA.

Three requests for copies of the draft FNSI and PEA were received by USAEC Public Affairs. No public comments were received.

5.0 CONCLUSION

Based on a review of the guidelines set forth in this Programmatic Environmental Assessment, installation staff will be able to utilize the screening criteria described to evaluate targetry replacement procedures. The installation staff should then be able to determine if the proposed action falls under the parameters of standard targetry replacement. The use of this PEA as a screening tool should not pose a significant impact to the human or natural environment as defined in 32 CFR Part 651. Therefore, a FNSI is recommended for the Proposed Action and a Notice of Intent to prepare an Environmental Impact Statement is not required.

James M. Milano

DATE: 12 APR 06

JAMES M. MILANO
Brigadier General, GS
Director of Training

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Executive Summary

This Programmatic Environmental Assessment (PEA) evaluates potential direct, indirect, and cumulative impacts of standard targetry replacement and alternatives on environmental and land use resources. The Army believes that the majority of typical and recurring actions associated with standard targetry replacement can be best and most efficiently addressed in this PEA, instead of a separate environmental assessment (EA) for every action, as normally or historically required. To insure proper utilization of this PEA, as well as compliance with the President's Council for Environmental Quality (CEQ) recommendations, a specific Record of Environmental Consideration (REC) is developed as part of these analyses for use in subsequent or "tiered" documents, supplemental analyses requirements are specified, and certification requirements by each individual project proponent are required.

The purpose of this PEA is to facilitate a specific Army installation's compliance with the National Environmental Policy Act (NEPA); providing (1) a framework to address the impacts of this type of actions, (2) a procedure to certify a complete understanding and mitigation plan (when required) for all impacts addressed in this PEA through the use of a specific REC, and (3) a procedure to insure the preparation of a focused, supplemental EA or Environmental Impact Statement (EIS), as required when site specific (tiered) analyses identify the need. This PEA provides the public and decision-makers with the information required to understand and evaluate the potential environmental consequences of targetry replacement actions, comprehend the need for required mitigations and certify their viability, and realize when supplemental analyses are required.

This PEA can be used to evaluate the potential environmental effects of standard targetry replacement and determine if any site-specific requirements require more detailed, focused, analyses. If the considerations and analyses in this PEA are applicable to local conditions and if no additional issues are identified, NEPA requirements may be met through the use of this PEA and the completion of the specified REC. It represents the first tier of environmental impact analysis associated with standard targetry replacement, completed under the auspices of the Army proponent. As such, it will either eliminate the need for additional future analyses, or provide focus for any supplemental analyses that may be required, consistent with the statutory and regulatory requirements, as well as CEQ recommendations. Subsequent NEPA analysis in the form of a supplemental EA or REC will be tiered under this PEA, and will be prepared when site-specific impacts cannot be avoided or mitigated, as specified herein.

The potential for significant environmental impacts for each alternative discussed, including the No Action Alternative, is identified. Under the Proposed Action alternatives, no significant environmental impacts will result, provided that site-specific conditions and criteria are met and that specified mitigation measures are implemented. If these specified mitigations cannot be implemented on a particular range to reduce potentially significant impacts, or, if site-specific conditions are not consistent with this

PEA, supplemental NEPA analysis and documentation will be prepared for targetry replacement at that specific range or installation.

When the need for NEPA analyses for specific targetry replacement is identified, this PEA can be used at the installation level to evaluate and compare site-specific information, and determine an appropriate level of environmental documentation (REC, Supplemental EA (SEA), or Notice of Intent to prepare a Supplemental EIS (SEIS)), as required for the action. If the alternatives, levels of analysis and site-specific information, and mitigation provisions are fully and accurately described in this PEA, a REC can be prepared, documenting this determination. The REC must certify that the installation has reviewed the proposed action, alternatives, potential impacts, and mitigations, and found them to be fully and accurately described by this PEA and Finding of No Significant Impact (FNSI). After such certification, no further documentation is required for NEPA compliance. The REC would also certify that no cumulative impacts would occur, consistent with CEQ procedures (CEQ, 1997).

If additional potential impacts or more significant impacts, beyond those described in the PEA are anticipated, or if they require additional mitigation measures not described in the PEA to keep impacts below significance levels, then a SEA (and FNSI) or SEIS must be prepared by the installation. During the preparation of such an SEA or SEIS, this PEA may be incorporated by reference and may serve to eliminate needless or excessive paperwork (sections 1500.4(b), (c), (f), (g), (i), (j), (m), and (q) of the CEQ regulations). Alternately, if the need for a more detailed environmental review is identified, or if the specific proposed action does not meet the specific criteria in this PEA, an SEA or SEIS may be eliminated as an option, and a separate standard EA or EIS, as required by 32 CFR 651, can be prepared.

The Army is required to meet the requirements of NEPA (42 USC §4371, *et seq*. 1970), subsequent regulations promulgated by the CEQ (CEQ, 1992), and 32 CFR Part 651, "Environmental Analysis of Army Actions; Final Rule". These requirements, and typical agency practice, have been the subject of considerable scrutiny over the years (CEQ, 1997 and 2003), leading to CEQ recommendations for improved efficiency and effectiveness in agency implementation of NEPA. These recommendations include the increased use of "programmatic" NEPA documents to eliminate redundant NEPA documentation, provide focus, and subsequent brevity on later tiered documents. In response to these CEQ recommendations, and under the provisions of the CEQ regulations themselves (CEQ, 1992), the Army has prepared this PEA to evaluate the potential environmental effects of a proposed Army program for standard targetry replacement on active Army ranges. In keeping with specific provisions of the CEQ regulations; sections 1500.4(i), "Reducing Paperwork", 1502.20, "Tiering", and 1502.4(c)(2), "actions that have relevant similarities, such as common...impacts, alternatives, methods, media..."

This PEA applies immediately to all actions described in this document. These analyses rely upon the Army’s historical experience with standard targetry replacement and range maintenance and operations.

1.0 INTRODUCTION

The Army's mission is to fight and win the nation's wars and ensure superiority over enemy forces. Effective training of soldiers and leaders is essential to this mission. Training must provide soldiers with opportunities to realistically practice their skills in the field. Soldiers are, in part, given opportunities to complete this training through the use of training ranges, several complexes of weapons-fire areas; maneuver training areas, and other operations and facilities. The Army currently has over 500 ranges, encompassing some 13 million acres. While many of these ranges will be significantly upgraded and modified, many will be maintained to support ongoing operations, and this maintenance includes standard targetry replacement, as analyzed in this PEA.

A typical Army range complex consists of small arms ranges, crew-served weapons ranges, multi-purpose ranges, special purpose ranges, training areas, and impact areas. Small-arms ranges are for individual weapons including handguns, machine guns, submachine guns, assault rifles and 40mm grenade machine guns. Crew-served ranges are designed for artillery (such as the M109A6 Paladin howitzer) and armor (such as the M1A2 Abrams tank and M2A3/M3A3 Bradley Fighting Vehicle). Special purpose areas are designed for aviation and other specialized weapons systems. Impact areas are either dudded, meaning that dud-producing (live ordnance that may become unexploded ordnance or duds) shells are fired upon it, or non-dudded, where simple projectiles such as small-arms ammunition, are fired. Some ranges are designed for laser simulation instruments and no live ordnance is fired upon the range.

There are a variety of standard targets on ranges. Each type is specific to the type of training supported by the range. Some targets are constructed of paper with personnel silhouettes for small-arms fire. These may be mounted on plywood. Other targets are constructed of pasteboard and polyethylene, and are either staked to the ground as stationary targets, attached to moving target carriers on rail systems, or attached to lifting mechanisms. The targetry mechanisms may receive instructions from cables or by wireless control. Some targetry mechanisms are powered by portable systems and some are fed through the installation's power system. Other range equipment includes devices that simulate muzzle flashes and sounds from enemy weapons.

The Range Division of the Directorate of Plans, Training, and Security typically manages Training Ranges on Army installations across the continental United States. Army Major Commands (MACOMs) centrally manage training ranges located outside the continental United States. US Army, Europe is responsible for ranges in Germany, Italy, and the Balkans, the 8th US Army is responsible for ranges in South Korea, and US Army, Pacific is responsible for training ranges located in Alaska and Hawai'i. Ranges are structured to support the installation Mission Commander's training and testing requirements.

The Army's Sustainable Range Program (SRP) is intended to improve the design, management, use, and sustainment of these training ranges. The SRP consists of two

programs, the Army Range and Training Lands Program (RTLP) and the Integrated Training Area Management (ITAM) program. The RTLP was initiated to support the transformation of Army ranges though central management, prioritization, planning, and programming of training ranges. The Army has placed an emphasis on instrumented or "digitized" ranges, as training methods adapt to new technologies and doctrines. Due to reductions in available training lands, installations often place new ranges on existing range footprints; and, in some cases, the need for a new range does not duplicate the purpose and objectives of the original range. However, in many cases, some targetry and range infrastructure can be re-used, saving costs and supporting range standardization. Ranges must have the potential for growth and improvement to accommodate new weapon systems and technology.

The Mission Commander and staff must determine the adequacy of training areas to support training requirements for both individuals and units, within the context of training guidance and doctrine. Using the RTLP methodology and the Army RTLP Requirements Model to determine training requirements, the RTLP Development Plan (RDP) can be generated, identifying training area users and training requirements, based on Army training doctrine and resource guidance. The RDP establishes requirements and utilization levels for available training assets, providing near- and long-term project plans for training, public works, and environmental planners. The installation ITAM and environmental staff determine durability, resiliency, and sustainability of training ranges, based on the ITAM land-carrying capacity methodologies, sound business investment practices, and environmental laws.

Target layouts on a range, or arrays, must reflect current threat doctrine, and meet size, quantity, and distance requirements in gunnery manuals, in accordance with Army Training Circular (TC) 25-8, "Training Ranges." TC 25-8 is a primary guide for installation and MACOM range development plans, and for developing the Army Master Range Plan, providing information on new standard ranges.

The Army baseline goal for annual training days is 242 days. The Army's goal is to schedule existing ranges to be used eighty percent of the days available for training, or 194 days. Out of the 194 scheduled training days, ninety percent, or 175 days, is the Army utilization goal. Range maintenance activities occur during non-use days.

Without routine maintenance, the efficiency, value, and overall efficacy of a training range decreases. Routine maintenance may include (but is not limited to) repairs and upkeep of roads, trails, and firebreaks. These actions include grading and clearing of roadsides, tree and brush removal, road resurfacing, soil stabilization activities, and culvert clearing, all covered by categorical exclusions (CXs) listed in Appendix B to 32 CFR 651, "Categorical Exclusions".

A major aspect of range maintenance includes the replacement of targetry and the infrastructure that supports its operation. This ongoing requirement is commonplace on existing ranges, and this PEA analyzes the potential impacts of these actions and the safeguards required to minimize such impacts.

1.1 Programmatic Nature of this Document

This document is programmatic in nature and scope, and is designed to assess the broad, generic impacts associated with standard targetry replacement, and to provide a framework for the effective and efficient analysis and discussion of such impacts. It does not quantify all site-specific impacts; nor does it attempt to identify, assess or disclose the impacts associated with standard targetry replacement at any specific location. Instead, it identifies *potential* impacts, evaluates the potential significance of those impacts, evaluates the Army specific mechanisms to effect or mitigate those impacts, and identifies those conditions and circumstances that limit those impacts, as well as those that may imply the need for more specific and detailed analysis.

1.2 Purpose and Need for the Proposed Action

Standard targetry replacement is a continuous, ongoing process on active Army ranges, and is critical to providing realistic and challenging training opportunities for soldiers and leaders, as they prepare to meet the challenges of the entire spectrum of armed conflict. As policy, doctrine, and lessons learned from current and on-going operations develops, and as advances in the technology to support the range infrastructure evolves, the Army must replace and update existing targetry at Army training ranges and facilities.

1.3 Actions Covered by this Programmatic Environmental Assessment

The proposed action of this PEA includes "standard targetry replacement" for all ranges managed by the active-duty Army. Individual installation staff must determine if their proposed actions qualify as “standard targetry replacement,” as established in this PEA, and evaluate any differences based on their individual mission requirements and practice. This PEA does not address any targetry replacement associated with new weapons systems fielded for initial testing and evaluation (T&E), as the NEPA documentation for new weapons systems should address such associated targetry replacement for these new systems. Following any such T&E, this PEA can be reviewed for applicability, and if conditions or conclusions warrant, a separate NEPA analysis (EA or EIS) may be required. If approved, this environmental assessment and targetry replacement evaluation may be applied to Army Reserve and National Guard ranges, as well, upon further review by those respective authorities.

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2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

"Standard targetry replacement" as defined in this PEA includes several different range maintenance actions: (1) the upgrade of power and communications systems on ranges, such as installation of fiber optic cables and removal of obsolete cable systems, which could include trenching activities and the use of heavy construction/excavation machinery; (2) "one-for-one" replacement of existing targetry that has exceeded its service life (either through use or age); and (3) replacement of hydraulic lifting devices with more environmentally-friendly mechanical (limited hydraulic or non-hydraulic) devices. This PEA does not cover the removal of unexploded ordnance that may be required prior to standard targetry replacement. Installation environmental staff must compare the specific Proposed Action to that included and evaluated in this PEA, determining the applicability of these definitions, considerations, assumptions, mitigations, and conclusions regarding the potential effect on the human and natural environment. Programmatic documents such as the installation Integrated Cultural Resource Management Plan (ICRMP), Integrated Natural Resource Management Plan (INRMP), Endangered Species Management Plan (ESMP), Range Management Plan, or Master Plan may be used to make these determinations. If this PEA is determined adequate, a REC as specified in Appendix A may be prepared to fulfill NEPA compliance. If a supplemental EA or EIS is required, this PEA can still serve as the first tier of NEPA analysis associated with standard targetry replacement, and, as such, it can eliminate the need for additional analyses or provide focus for the supplemental analyses, consistent with statutory and regulatory requirements and CEQ recommendations.

2.2 Alternatives to the Proposed Action

2.2.1 No Action Alternative

The No Action Alternative, *i.e.* no targetry replacement, would lead to a degradation of the range facility, and the inability to train troops in support of the Army mission. While not supportive of the stated purpose and need, this alternative provides a baseline for comparison to the Proposed Action and other alternatives listed in this section.

2.3 Alternatives Evaluated but Eliminated from Further Study

2.3.1 Construction of a New Range with Modernized Targetry System

This alternative would involve extensive construction and earthmoving on a new site. It would require considerable ground-disturbance, resulting in numerous potential impacts to the human and natural environment. As a result of these numerous and potentially significant site-specific impacts, this alternative will require a separate EA/EIS, and is eliminated as an alternative in this PEA. In addition, the costs and time involved in the construction of a new range are significantly greater than those associated with the proposed action, standard targetry replacement as part of range maintenance activities. Therefore, this alternative is not further analyzed.

2.3.2 Travel to Another Installation and the Use of Their Range

Although units may participate in annual exercises at specialized off-post training centers such as the National Training Center in California or the Joint Readiness Training Center in Louisiana, this alternative involves off-post activities, in lieu of standard targetry replacement. The transportation of soldiers, weapons and ammunition to another installation for routine, non-annual training would require significant increases in the cost and time required to conduct required training, even beyond the costs associated with standard targetry replacement. These costs would be installation-specific, dependent on the distances traveled, modes of travel available at the installation, and other site-specific factors that cannot be readily assessed in a programmatic manner. Given the cost of transportation, per diem costs to sustain soldiers at a remote location, and the added logistical timelines, this alternative is prohibitively costly, unsustainable, and undesirable.

The environmental effects of this alternative are likely significant when compared to the both the Proposed action and the No Action alternative. Most of these effects would be attributable to transportation requirements, added fuel consumption, and accompanying environmental effects. Such "embedded" energy costs (both the costs of fuel and the environmental effects) are additional costs, beyond those of training at the host installation.

As a result of both the increased mission costs, and the increased environmental effects, this alternative is neither practical, nor cost-effective, and is not further analyzed.

2.3.3 Build a Simulation, Sub-caliber, or Reduced-Scale Range Representative of a Full-size Range Equivalent

Construction of such a range would be both cost- and time-prohibitive, and would exceed the costs of standard targetry replacement. In addition, this approach would reduce the realism of the training, required by Army guidance (TC 25-8), and would not support the training "through-put" required for the increased future training range demands. While a reduced-scale range would be more economically feasible, it would not provide soldiers with adequate and sufficient live-fire training opportunities, and is not a viable alternative. Therefore, this alternative is not analyzed further.

3.0 AFFECTED ENVIRONMENT

This section will describe in broad terms the local (installation) natural environments in which standard targetry replacement would occur. Although this environmental description may not cover all Army installations, the majority of Army installations in the continental United States are described. The physical characteristics (including overall air quality, noise, water quality, soils and geology, natural resources, threatened and endangered species, and cultural resources) are briefly described, and the installations that specifically fit these descriptions are identified.

3.1 Natural Resources, Geology, and Soils

The classifications and interpretations of the natural environment are taken from Description of the Ecoregions of the United States (Bailey, 1995). These are then augmented by Army sources, referenced in each section, as they apply. In these descriptions, most species and landforms are discussed in common terms. The discussions of soils, however, do not readily lend themselves to such simplified discussion, and are therefore defined as follows:

Entisols are soils with little or no evidence of soil formation. They are either young soils, or their parent material has not yet reacted to soil forming factors. They may be formed on fresh lava flows or recent alluvium for which there has been too little time for soil formations to take place. They are found in extremely dry areas with too little water and vegetation to facilitate soil formation, or on steep slopes, where the rates of erosion may exceed the rate of soil formation, preventing soil horizon development. Management needs vary, depending on climate and topography, but in most cases they are erodable, and should be maintained with natural vegetation.

Aridisols are dry soils, and are characterized by a subsurface accumulation of salts such as calcium carbonate, gypsum, other soluble salts, or sodium. Overgrazed aridisols are often left bare and are subject to wind erosion. They are found in the western United States.

Alfisols are developed under forests, in cool to warm humid areas, and are characterized by a subsurface horizon in which silicate clay has accumulated. These soils are often found on sloping to steep land, and are susceptible to soil erosion. Alfisols display moderate movement of soil materials, either in a downward or horizontal direction, caused by excessive water in the soil, and fairly high base status.

Mollisols are the dark soils of grasslands. They have high organic matter, and are productive agricultural soils. Management issues deal with use of fertilizers and the maintenance of crop or vegetative cover to prevent erosion.

Ultisols are developed primarily in forested, humid tropical, and subtropical areas, found in the southeastern United States. These soils are characterized by acidic, highly weathered layers with accumulations of silicate clays in subsurface layers that usually form in tropical and subtropical climates. In some ultisols the topsoil has been eroded,

leaving the red-colored B horizon at the surface. Soil conservation practices are needed to prevent further soil deterioration. In areas with significant slope, any exposed land must be revegetated.

Oxisols are highly weathered soils, found mostly in tropical areas. An easily recognized subsurface layer of iron and aluminum may be evident.

Inceptisols are in the early stages of soil profile development, after entisols. Management requirements vary, depending on climate and topography.

Spodosols are acidic, sandy, forest soils. They are characteristic of cold, moist to wet climates. Spodosols drain well and are less susceptible to erosion than more finely textured soils. The presence of a forest cover can help moderate peak stream flows.

Vertisols have a high content of sticky or swelling and shrinking type clays to a depth of one meter or more. In dry seasons, these soils develop deep wide cracks, diagnostic for this soil order. Also typical is an uneven surface with microbasins and knolls. They are found most frequently in subhumid to semiarid environments, and exhibit high erodibility.

3.1.1 Continental Eastern Broadleaf Forest (Fort Campbell, KY and TN; Fort Knox, KY; Fort Leonard Wood, MO; Fort Drum, NY; and Fort McCoy, WI) [Bailey's 222]

Most of the Continental Eastern Broadleaf Forest region has rolling terrain with some nearly flat components. The northern parts have been glaciated. Intermittent and perennial streams and rivers, with a moderate volume of water at low velocity, are found in southwestern Kentucky. Water resources in northwest New York include perennial streams, inland lakes, canals, reservoirs, and wetlands. Moderate gradient streams occur in the foothills. Low gradient streams and rivers in central Wisconsin normally drain into the Great Lakes. Small to medium sized lakes occur, and wetlands are found in extensive low-lying areas in former glacial lakebeds. Elevations range from 80 ft to 1,650 feet. Average annual temperatures range from 40° F, in the north, to 65° F in the south. Precipitation varies between 20 – 50 inches/year. Summers are hot, with frequent tornadoes. Most precipitation occurs during the growing season.

This region is dominated by broadleaf deciduous forest, but drought-resistant oak-hickory also occurs. The forest understory is usually well developed, and includes species such as dogwood and hornbeam. The shrub layer is distinct, with some evergreens, and several wildflower species occur.

The soils change from alfisols in the north to ultisols in the south. Within the continental interior, calcification is evident. These soils are deep, hold moderate moisture, have subsoil high in clay content and mesic temperature regime. This ecosystem is classified as having High-Moderate Resiliency (CSU, 1997).

The gray squirrel, fox squirrel and eastern chipmunk are common in this area. During the summer, scarlet and/or summer tanagers, rose-breasted grosbeaks, and ovenbirds are common. The wild turkey also occurs here, as well as the cerulean warbler. Blue jays are abundant.

3.1.2 Oceanic Eastern Broadleaf Forest (Fort Dix and Fort Monmouth, NJ and Picitinny Arsenal, NJ) [Bailey's 221]

Landforms in the Oceanic Eastern Broadleaf Forest region are mostly hilly and mountainous; and stream flow is relatively slow to the Atlantic Ocean and Delaware Bay. While natural lakes are rare, small water impoundments are common along the upper reaches of streams. Elevations range from about 1,000 to 3,000 feet. In the lower half of New Jersey, elevations are only as high as 300 ft, with the majority of the area less than 150 ft. The continental climate ensures a strong annual temperature cycle, with warm summers and cold winters. Average annual temperatures are about 50° F. Precipitation varies from 35 to 60 inches/year, and in the lower half of New Jersey the precipitation varies from 42 – 45 inches. Rain is greater in the summer months, when evapotranspiration is great and moisture demands are high.

Vegetation is dominated by tall broadleaf trees, with dense canopies in summer, and bare in winter. Lower layers tend to be correspondingly sparse. Typical forest vegetation is divided into mixed Appalachian oak and pine-oak stands. Pine barrens with grassy savannas are found in dry sandy soils, with thick shrubs often growing beneath the pines.

Soils are characteristically Alfisols, well developed and containing a subsurface layer of clay and a mesic temperature regime. Humus is often abundant in deciduous forests.

Important mammals include whitetail deer, black bear, bobcat, gray fox, raccoon, beaver, muskrat, mink, gray squirrel, eastern chipmunk, white-footed mouse, pine vole, and short-tail shrew. Box turtle, common garter snake and timber rattlesnake are characteristic reptiles.

Bird populations can be large. Abundant breeding birds include the cardinal, tufted titmouse, wood thrush, summer tanager, red-eyed vireo, blue-gray gnatcatcher, ruffed grouse, woodcock, and Carolina wren. In wetlands areas, duck species, geese, rails, herons, and shorebirds are present.

3.1.3 Outer Coastal Plain Mixed Forest (Fort Bragg, NC; Fort Jackson, SC; Fort A. P. Hill, VA; Camp Blanding, FL; Fort Polk, LA; Camp Shelby, MS; Fort Stewart, GA; Fort Rucker; Fort Lee; and Aberdeen Proving Ground, MD.) [Bailey's 230]

This ecoregion is composed of flat, irregular Atlantic and Gulf Coastal Plains down to the ocean. Most of the area is gently sloping, with some local relief of less than 300 ft.,

and numerous streams and lakes, most of which include sluggish marshes and swamps.

The climate regime is equable, with small to moderate annual temperature range with the average being 60° – 70° F. Precipitation is abundant and well distributed ranging from 40 – 60 inches a year.

Temperate evergreen forest is common here; and common species include evergreen oaks and laurels and magnolias. Well-developed lower strata may consist of tree ferns, small palms, shrubs and herbaceous plants. Epiphytes (orchids or ferns that grow on plants) are common, with locally abundant Spanish moss a prime example. Atlantic coast marshes are dominated by gum and cypress, with upland areas often supporting upland savannas of pine canopies over grass, sedge, and forb understories. Poorly drained upland bog pocosins occur in shallow depressions. While needleleaf evergreen or coniferous forests are often shown on vegetation maps of the region, evergreen oak and magnolia forest is the climax vegetation of mesophytic habitats.

Soils are mainly ultisols, spodosols and entisols. Spodosols are soils commonly found in cool, moist environments under coniferous forest vegetation. Surface litter, composed of pine needles, breaks down in the presence of water to form a weak organic acid. Acidic soil water removes base ions in solution, to create an acidic soil. Easily dissolved materials are leached from surface layers, leaving behind the most resistant material like quartz, and creating an ashy-gray, near-surface layer. Deep layers are stained with iron and aluminum oxides. Entisols are weakly developed soils that do not exhibit distinct horizons. They are often found in recently deposited parent material, steep slopes, or other environments that inhibit soil development.

Most soils supporting temperate rainforests are wet, acidic and low in major plant nutrients. Sands are often prevalent in hilly areas, but may also cover large areas of central Florida. Soils are generally deep and well drained; except in North Carolina, where soils can range from well- to poorly-drained. This ecoregion is classified as High to Moderate Resiliency (CSU, 1997).

Whitetail deer are often the only large indigenous mammal, except for small areas supporting black bears, and even smaller areas sheltering the almost extirpated Florida panther. Raccoons, opossums, flying squirrels, rabbits and many species of ground-dwelling rodents represent small mammals. Bobwhite quail and wild turkey are the most popular game birds. Migratory non-game birds, including neotropical migrants, are numerous, as are wintering waterfowl. The American alligator is the largest reptile of the region.

3.1.4 Southeastern Mixed Forest (Fort Benning, GA; Fort Gordon, GA; Fort McPherson, GA; Fort McClellan, AL; Redstone Arsenal; and Fort Pickett, VA) [Bailey's 231]
This ecoregion includes the Piedmont and the Gulf Coastal Plains, with the majority of the area having gentle sloping. On the Gulf Coastal Plain, local relief of 100 to 600 ft. is seen, whereas on the Piedmont the local relief varies from 300 to 1,000 ft. Numerous streams are found in the coercion, most of them sluggish. There are also numerous lakes, swamps and marshes.

The climate is generally uniform across the region, with mild winters, and hot, humid summers. Average annual temperature varies from 60° – 70° F. The growing season is long (200-300 days) but frost occurs every winter. Annual precipitation varies from 40 to 60 inches per year, but peaks slightly in midsummer or early spring, when it when it falls mostly in thunderstorms. Snow falls rarely, and melts almost immediately.

Climax vegetation consists of medium-tall to tall forests of broadleaf deciduous and needleleaf evergreen trees, 50 % of which are loblolly pine, shortleaf pine, and other southern yellow pine species. Common associates include oak, hickory, sweetgum, blackgum, red maple, and winged elm. Main grasses include bluestem, panicums, and longleaf uniola. Dogwood, viburnam, haw, blueberry, American beautyberry, youpon, and numerous woody vines are common.

Soils in the ecoregion include strongly leached ultisols and vertisols. The vertisols are clayey that form deep, wide cracks when dry. Ultisols are rich in oxides of both iron and aluminum and poor in many nutrients essential for successful agricultural production. Inceptisols are found on floodplains of major streams and are good agricultural soils. This ecoregion is classified as High to Moderate Resiliency (CSU, 1997).

Fauna vary, depending on localized conditions, though whitetail deer, cottontail rabbits, raccoon, and fox are widespread. When deciduous trees are present, fox squirrels are common on uplands, and grey squirrel live along intersecting drainages. The nine-banded armadillo is frequently encountered in the western part of this province. The eastern wild turkey, bobwhite quail, and mourning dove are widespread. Of the 20-odd bird species present in mature forests, the most common are the pine warbler, cardinal, summer tanager, Carolina wren, ruby-throated hummingbird, blue jay, hooded warbler, eastern towhee, and tufted titmouse. The red-cockaded woodpecker is the most prominent endangered species. Forest snakes include the cottonmouth moccasin, copperhead, rough green snake, rat snake, coachwhip, and speckled kingsnake. Fench and glass lizards are also found, as well as the slimy salamander.

3.1.5 Pacific Lowland Mixed Forest (Fort Lewis, WA) [Bailey's 242]
This area is a north-south depression between the Coast Ranges and the Cascade Mountains. Elevations range from sea level to 1,500 feet. The Puget Sound Valley is a moderately dissected tableland covered by glacial till, glacial outwash, and lacustrine deposits. Isolated hills and low mountains are also found in this region.

The climate is usually mild throughout the year; and the average annual temperature ranges from 48° – 55° F. The moderate rainfall reaches maximum amounts during the winter; summer exhibits a slight moisture deficit, partially compensated by fog. Average annual rainfall ranges from 15 to 60 inches/year; but some locations range from 30 to 45 inches/year. The coastal mountains are responsible for the drier climate.

Before cultivation, dense coniferous forest dominated the vegetation. Common trees include the western red cedar, western hemlock, and Douglas fir. In interior valleys, the coniferous forest is less dense than along the coast; and often contains deciduous trees, such as big-leaf maple, Oregon ash, and black cottonwood. There are prairies that support open stands of oaks, or are broken by groves of Douglas fir and other trees. Principal indicator species include Oregon white oak and Pacific madrone. Poorly drained sites, with swamp or bog communities, are abundant.

In the Puget lowlands, and the foothills bounding the lowlands, soils have formed in and on drift deposited by continental glaciation. Inceptisols dominate the Puget Sound Valley. Soils are a mosaic of deposits resulting from glacial processes. Soils with a silica-cemented hardpan occur on gravelly till deposits. Excessively drained, coarse textured soils, with low water-holding capacity, occur in sandy and gravelly outwash deposits. Fine textured, poorly drained soils occur in silty and clayey lake and marine deposits. On the floor of depressions in the glacial drift, soils are poorly drained and have accumulations of organic matter. This ecoregion is classified as High Resiliency (CSU, 1997).

Alfisols, inceptisols and ultisols are the predominate sols in this ecoregion. Inceptisols are the principal soils in the Puget Sound Valley.

Mule deer are the most common large mammal. Primary mammalian predators are the mountain lion and bobcat. The western gray squirrel lives in oak trees, and the bushytail wood rat builds nests on shrub-covered stream margins and at forest edges. Brush rabbit and gray fox inhabit isolated thickets.

3.1.6 Temperate Prairie Parkland / Great Plains Steppe and Shrub (Fort Riley, KS) [Bailey's 251/311]

This extensive area consists of alternating prairie and deciduous forest, with mostly gently rolling plains and steep bluffs bordering many valleys. Some areas are nearly flat, and others have high, rounded hills. Elevations range from 300 to 2,000 feet. The far northern reaches of this ecosystem were once glaciated.

The summers are normally hot and winters are cold, with average annual temperatures of 50° F. The frost-free season ranges from 120 days, in the northern portion, to 235

days, in the southern portion. Average annual precipitation varies from 20 to 40 inches/year, falling predominately during the growing season.

Forest-steppe is the dominant vegetation, intermixed with prairie, groves, and strips of deciduous trees. Forest and prairie alteration in the western portion of this region is due to the local soil conditions and slope exposure; and trees occur near streams and on northern facing slopes. The limestone hills have only thin soils, and support few trees. In the eastern portion, however, trees can be found on most of the highest hills. The prairies are not forested due to the frequency of fires (often natural in origin), or because areas affected by the last glaciation have not yet reached that point in their succession. Bunches of tall grasses dominate the prairie with the most common species being big bluestem, little bluestem, switchgrass, and Indian grass in addition to many wildflowers and legumes. Where fire and grazing are controlled, deciduous trees are taking over the landscape. Much of this region is cultivated, due to the favorable climate and soils. The upland forest areas are dominated by oak and hickory species. The deciduous forest is richer on the floodplains and moist hillsides. The western portion of the region includes eastern cottonwood, black willow and American elm.

Mollisols occur mostly throughout the ecosystem, with Alfisols in the Mississippi Valley. These soils develop under grassland vegetation and are well known for their rich organic dark brown to black surface layers. Mollisols are high in nutrients and rich in calcium soils, among the most fertile soils on the earth. Mollisols are found in the drier portions of the humid continental climate through the steppe climate. Soils have a mesic or thermic temperature regime with mixed mineralogy. This ecoregion has been classified as High Resiliency (CSU, 1997).

Many species of both prairie and forest animals can be found in this ecoregion. Specifically, mink, river otter, belted kingfisher, bank swallow, spotted sandpiper, and green-backed heron occur in the riverine forests. Thirteen-lined ground squirrels, and blacktail prairie dogs, are common on the prairies.

Upland bird species include the horned lark, eastern meadowlark, and mourning dove.

3.1.7 Great Plains Steppe and Shrub (Fort Sill, OK) [Bailey's 311]

This region is characterized by flat rolling plains with little relief. Elevations range from 3000 ft in the west to and 1600 feet in the east. Slopes on these dissected plains range from nearly level to gently sloping, but slopes in the valleys are short and steep. The Wichita Mountains, located in SW Oklahoma rise as much as 1,000 ft. above the surrounding plains. Average annual temperatures range from 40° – 65° F. Annual precipitation varies from 15 to 30 inches/year

The climate is semiarid-subtropical. Summer remains dry, due to high temperatures although maximum rainfall occurs in this season, mostly in the form of rain. Winters are dry and cold, and summers warm to hot. The frost-free season lasts for 185 to 230 days.

Vegetation varies from tall grass prairie to short grass steppe. Short dominant species include blue grama, hairy grama, and buffalo grass. Taller dominant grass species include little bluestem and needle-and -thread grass. Woody vegetation is rare.

The soils are primarily Mollisols, with smaller areas of Alfisols. This ecoregion is classified as Moderate to Low Resiliency (CSU, 1997).

Pronghorn antelope and coyotes occur, as well as jackrabbits and many species of burrowing rodents. Mourning doves are abundant in addition to the sharp-tailed grouse, greater prairie chicken, and bobwhite.

3.1.8 Chihuahuan Desert (Fort Bliss, TX; White Sands Missile Range, NM; and Fort Huachuca, AZ) [Bailey's 321]

This zone is mostly desert, where permanent streams are on a few rivers which originate in more humid areas. The Pecos Rivers and the Rio Grande and several of their larger tributaries are only perennial. This ecoregion has undulating plains which reach 4,000 ft. where isolated mountains with elevations to 5,000 ft. Washes fill up with water following rains but are mostly dry during the year. Basins with no outlets may drain into shallow playa lakes that will become dry throughout rainless periods. There are constant whirlwinds, which play over the dry lakes when the temperatures rise during the sunny summer months. Dunes of silica sand are extensive and cover parts of this zone. Some gypsum dunes may be found, the most prominent found at White Sands near Alamogordo. Isolated buttes and small beds of black lava occur in scattered areas.

Summers are hot, dry, and long, with winters being short; but may include periods of below freezing temperatures. Average temperatures range from 50° F – 65° F. This ecoregion is distinctly arid, with extremely dry spring and summer months. Average annual precipitation at Fort Bliss is 8.65 inches. July is the time when summer rains usually begin with mostly local torrential storms continuing throughout October.

Vegetation includes several types of thorny shrubs typical of the Chihuahuan Desert, which grow frequently in open stands often associated with short grasses such as grama species. Arid grasslands are abundant on the high plains. Where the soil is deep, honey mesquite often dominates. Cacti are also extensive particularly in the Sonoran desert. Yuccas characterize the desert with a few cottonwoods alongside

widely separated rivers with creosote bushes especially common on gravel fans. Lechuguilla is also abundant and candelila or wax plants. Rocky slopes have ocotillo with juniper and pinyon pines are limited to the rocky outcrops.

Soils are predominantly aridsols in the north and west while both aridsols and entisols are present in the south. This ecoregion is classified as having Low Resiliency (CSU, 1997).

Mule deer and the pronghorn sheep dominate as large game animals. The javelina and collared peccary are common in the south with whitetail deer in parts of Texas. Smaller mammals include the kangaroo and wood rat, desert cottontail and blacktail jackrabbit with many smaller rodents competing with grazing and wild herbivores for available forage. Mammalian predators consist mainly of bobcats and coyotes.

The most abundant bird is the black-throated sparrow but the curve-billed thrasher, Greater roadrunner, and Chihuahuan raven are also present. Quail bobwhites also occupy the ecoregion. Predators include hawks, golden eagles and great horned owls.

Many reptiles are common including the common chuckwalla, desert spiny and Texas horned lizards and numerous species of rattlesnakes.

3.1.9 American Semi-Desert and Desert (Fort Irwin, CA and Yuma Proving Ground, AZ) [Bailey's 322]

The American Desert includes the Mojave, Colorado and Sonoran Deserts. Its topography is characterized by extensive plains, most gently undulating, from which isolated low mountains and buttes rise abruptly. The mountains are rocky, and rise abruptly from their outwash aprons and alluvial faces. A large portion of this region drains to the sea through underground seepage, or through washes that are dry most of the year. In the Mojave, bedrock controlled channels in the mountains carry seasonal flows to alluvial channels below. Elevations range from 280 feet below sea level to 11,000 feet.

Summers are long and hot, with the average annual temperature ranging from 60° – 75° F. Winters are generally moderate, though occasional frosts do occur. The winter rains are widespread and usually gentle, but thunderstorms are common during the summers. Average precipitation in the valleys varies from 2 to 10 inches/year, but may reach up to 25 inches/year on the mountain slopes.

Vegetation is normally sparse, with bare ground separating individual plants. Cacti and thorny shrubs dominate, but many other shrubs and herbs also occur. Gravel or bare

rock covers the ground near the bases of some mountains, with much bare rock exposed on mountain slopes.

Entisols occur on the older alluvial fans and terraces, and in better-drained basins. Aridisols dominate the rest of the region. Aridisols are the soils of arid and semiarid environments where moisture is scarce. These soils are typically light in color, as there is little vegetation to add organic matter to the soil profile. Calcification and salinization are important soil forming processes acting in these soils. Soil horizons are weakly developed and sodium is often high in concentration, making them alkaline. The soils generally have thermic or hyperthermic temperature regimes, except in the mountains where there are mesic and frigid soil temperature regimes. There may be areas in this region that contain salt-affected soils. This ecoregion is classified as Low Resiliency (CSU, 1997).

The desert kit fox and coyote are present, and the western spotted skunk is common. Many nocturnal burrowers, such as kangaroo rats, dominate. The long-tailed pocket mouse and antelope ground squirrel are key species as well. While there are numerous desert bird species, they are quite selective of their habitat type. Numerous snakes and lizards are also present.

3.1.10 Great Plains-Palouse Dry Steppe (Ft. Carson, Piñon Canyon, CO) [Bailey's 331]
These plains are generally flat, with occasional valleys, canyons, and buttes. The northerly plains are broken by badlands and isolated mountains. This region consists of rolling plains and tablelands of moderate relief, in a broad belt that slopes gradually eastward. Ground water is associated with sand and gravel over much of the area, but is scarce where shale bedrock is near the surface. The Palouse region has many loess-covered basalt tablelands whose altitudes range from 1,200 to 6,000 feet. The Great Plains grasslands are semiarid.

The average annual temperature is 45° F throughout most of the region. Precipitation ranges from 10 inches/year, in the northern portion, to more than 25 inches/year, in the south, most occurring during the summer months, except in the Palouse grassland, where maximum precipitation is during the winter. Much of the precipitation occurs during intensive weather events, such as hailstorms or blizzards. Tornadoes and dust storms are frequent.

The Great Plains grasslands have scattered trees and shrubs, such as sagebrush and rabbitbrush, and form gradient levels of cover, from semi-desert to woodland. Vegetation is sparse, and the soil is typically exposed. There are numerous species of grasslands and herbs, including buffalo grass, sunflower and locoweed. The Palouse grassland, although similar in appearance to the Great Plains grassland, have distinct grass species such as blue bunch wheatgrass, fescue, and bluegrass.

Calcification is the main soil-forming process over most of the region, with salinization occurring in poorly drained soils. These soils therefore contain large amounts of precipitated calcium carbonate, and are rich in bases (alkaline). Mollisols are common. The humus content in the soils is small, because of the sparse vegetation in the area. These soils have mesic temperature regimes. This ecoregion has been classified as Moderate to Low Resiliency (CSU, 1997).

The pronghorn antelope is the most abundant large mammal, with the mule deer and whitetail deer common in brushy areas along streams. The whitetail and blacktail jackrabbit is common in the northern and southern portions of the region, respectively. The desert cottontail is widespread. The lagomorphs, prairie dogs, and other small rodents are prey for coyotes, and raptors. The thirteen-lined ground squirrel is common prey, along with prairie dogs, for badgers. The Washington and Columbia ground squirrels are numerous throughout the Palouse grassland. There are many gallinaceous bird species including the threatened lesser prairie chicken, the sage grouse, the greater prairie chicken, and the sharp-tailed grouse. Other bird species include the horned lark, lark bunting, western meadowlark, mountain plover, and McCown's longspur.

3.1.11 Intermountain Semi-desert (The Orchard Training Area, Dugway Proving Ground, and Yakima Training Center, WA) [Bailey's 342]

This region covers the plains and tablelands of the Columbia-Snake River Plateaus and Wyoming Basin. The plateaus are surrounded by lava that has been folded or faulted into ridges. Plateaus grade into basins and ranges of the Intermountain Desert. In the Columbian River Basin, the Columbia River is the major surface water, and includes many major man-made reservoirs. Wetlands and marshes are extensive, although many have been drained. Elevations in the Wyoming Basin range from 6,000 to 8,000 feet, and are broken by lower mountains of 1,000 to 2,000 feet in height.

The climate is semiarid and cool, with an average annual temperature of 50° F, except in the Wyoming Basin, where average temperatures range from 40° F – 52° F. Annual precipitation varies from less than 10 inches/year, in the west, to 20 inches/year, in the east, and, in the Wyoming Basin ranges, from 5 to 14 inches/year.

Sagebrush steppe, composed of sagebrush or shadscale mixed with shortgrasses, is the dominant vegetation. Moist alkaline flats support greasewood. Along streams in (and near) the mountains, valleys contain willows and sedges.

Extensive alluvial deposits are in the floodplains of streams, and in the fans at the foot of the mountains. In the numerous dry lakebeds, there are eolian deposits with both dune sand and loess. Aridisols dominate basin and lowland areas; and Mollisols are at higher elevations. Alkaline aridisols dominate the Wyoming Basin. Xeric (low-water)

soils have mesic (and in the uplands, frigid) soil temperature regimes. Additionally, in the Columbia River Basin, volcanic ash is a small part of the soil composition. This ecoregion has been classified as Low Resiliency (CSU, 1997).

Major mammals include coyote, pronghorn antelope, mountain lion, and bobcat. Smaller species include Wyoming ground squirrel, whitetail prairie dog, deer mouse, jackrabbit and porcupine. Numerous waterfowl inhabit the area during the breeding season and migration. Species include mallards, pintails, green-winged teal, and gadwalls. Canada geese, hawks, and owls are also present, and sage grouse are the dominant game bird. Horned lizards are present, in addition to the prairie rattlesnake.

3.1.12 Southwest Plateau and Plains Dry Steppe and Shrub (Fort Hood, TX and Camp Bullis, TX) [Bailey's 315]

This region is characterized by rolling plains and plateaus, occasionally dissected by canyons near some of the fringes of the region. Elevations range from sea level to 3,600 feet, on the Edwards Plateau, up to 6,500 feet, near the Rocky Mountain Piedmont, and a mesa-and-butte landscape is common in some areas. There are a small number of intermittent and occasional perennial streams, in a dendritic pattern, all generally with a low volume of water flow at low velocity, except at the plateau escarpment, where flow rates can be high. The climate is semiarid, with long, hot summers and short, mild winters. Annual temperatures average 65° F. Precipitation, maximized during the growing season, is about 30 inches/year, in the eastern part, and 10 to 15 inches/year, in the western portion. Evaporation is an important factor, ranging from 71 to 79 inches/year (2,000 mm/yr), and, between May and October, evaporation can be twice the level of precipitation.

Arid grasslands dominate, with groups or singles of shrubs or low trees. A mesquite-grass landscape dominates most of the plains area, except in northwest Texas and eastern New Mexico, where xerophytic grasses, such as blue grama and buffalo grass, are the dominant vegetation. On the Edwards Plateau, oak and juniper are frequently mixed with the mesquite and grasses, and, on steep, rocky slopes, these two tree species can form closed stands. The trees seldom grow higher than 20 ft. The most common tree species is Ashe juniper. Over much of the Plateau, the dominant vegetation is grass with trees and shrubs found only in very open stands. The predominant grass species is usually the prairie three-awn (needlegrass).

Soils are varied, but correlate with the different plant communities. Mesquite-live oak savanna is the only entisol. Mesquite-buffalo-grass and juniper-oak savannas are almost exclusively Mollisols; and Alfisols are at the boundaries of the mesquite-oak savanna. In the mesquite-acacia savanna: Mollisols, alfisols, and vertisols occur. In the Texas Staked Plains, low sandy soils permit the growth of one main species, low shin oak. This ecoregion is classified as Moderate to Low Resiliency (CSU, 1997).

The Mexican ground squirrel and gray fox occur here, as well as whitetail deer and armadillo. Major furbearers are ringtail and raccoon. The Edwards Plateau region has many limestone caverns inhabited by large populations of Mexican freetail bats. Common game birds include wild turkey, mourning dove, scaled quail, and bobwhite. Other birds include many species of hawks and owls.

3.1.13 Yukon Intermontane Plateaus Tayga (Fort Wainwright and Fort Greely, AK) [Bailey's 131]

This area includes low mountain dissected uplands and hills interspersed with lowland basins and valleys with alluvial deposits extending across interior Alaska between the Brooks and Alaska Ranges. Elevations range from 980 to 1970 ft. on ridges in the north to 4,920 ft. in the south. Four major rivers, the Yukon, Tanana, Koyukok, and upper Kuskokwim provide the ecoregion's outstanding hydrologic features. Glacial features are prevalent in much of the region. Deep narrs are poorly drained and covered with peat; while river terraces are better drained valleys are common.

Extreme temperatures dominate the semi-arid climate; summers are short and hot with temperatures reaching 100° F but winters are long and severe with temperatures as low as -75° F. Average annual precipitation is just 17 inches. Temperature inversions frequent in upland areas result in warmer temperatures on lower slopes.

The major rivers support dense white spruce–cottonwood-poplar forests on the floodplains and south facing slopes. Undergrowth consists of dense shrubbery mostly of willow, dogwood, green and thinleaf alder and berries. The outer valley edges support coniferous and evergreen forests. The undergrowth is predominately willow, lichens and mosses, blueberry, fern, crowberry and dwarf birch. Upland zones are covered with dense white birch-aspen-poplar forest. Root systems are shallow with water balance probably limiting growth because of the hot, dry summer climate.

The most commonly seen soils are wet inceptisols in flats and low areas and they are deep and well drained. Lower parts of floodplains are poorly drained and covered with peat but river terraces are better drained. Permafrost is discontinuous in major river valleys. Soils on north facing slopes are shallow and poorly developed with continuous permafrost. Upland soils support spruce-hardwood forests, which are well-drained inceptisols over continuous permafrost.

Spruce-hardwood forests provide excellent habitat for furbearers and other mammals. Brush zones and immature forests recovering from fires furnish especially good habitat for moose. Common game animals in addition to moose include brown and black bear, wolverine and wolf, and caribou. Smaller mammals include red fox, beaver, mink, muskrat, lynx, red fox, river otter, weasel, red and northern flying squirrel, marten and deer mouse.

Woodland birds are plentiful because of habitat. Upland birds include boreal chickadee, spruce grouse and northern hawk-owl.

3.1.14 Coastal Trough Humid Tayga (Fort Wainwright and Fort Richardson, AK) [Bailey's 135]

This region consists of smooth and irregular plains surrounded by high mountains. The low-lying areas are typically less than 500 ft. above sea level, with local relief of 50-250 ft. The Copper River lowland is a broad basin of rolling and hilly moraines and nearly level alluvial plains on the site of a Pleistocene glacial lake. With an altitude of 1000-2000 ft., it is cut by the Copper River and its tributaries, which form steep-walled canyons 100-300 ft. deep.

The climate is subarctic, but less severe than the Alaskan interior as its sheltered by the Alaskan Range to the north. Proximity to the Gulf of Alaska allows the climate to transition to the marine climates to the south. Average annual temperatures range from 32 to 39 degrees F, with a winter average of 5° F and summer maximums of about 64° F. Average annual precipitation ranges from 10 to 18 inches. Annual snowfall averages from 4 to 10 inches.

Throughout the Cook Inlet Lowlands, lowland spruce-hardwood forests are abundant. Bottomland spruce-poplar forest adjoins the larger river drainages, with thickets of alder and willow. Wet tundra communities exist along the coastline. The Copper River Lowland is dominated by black spruce forest interspersed with large areas of brushy tundra. On south facing moraines white spruce forests occur and cottonwood-tall bush communities are common on large floodplains.

Spodosols are the principal upland soils in the Cook Inlet. Inceptisols are dominant in the lowlands of the Copper River. This ecoregion is classified as Moderate to Low resiliency (CSU, 1997).

Diverse habitats support a large variety of species. Moose flourish and do muskrats and red foxes. Dall sheep are frequently seen on the uplands. Black bear populations are dense throughout the ecoregion.

Trumpeter swans nest and tundra swans migrate through the ecoregion. King, sockeye and silver salmon are common and often abundant.

3.1.15 Hawai‘i (Schofield Barracks and Pōhakuloa Training Area) [Stryker Brigade Combat Team Final EIS, Hawai‘i]

Schofield Barracks, Main Post totals 11,448 acres on O‘ahu including training ranges. Land uses surrounding the Main Post include agriculture, forest, urban, and military. Pōhakuloa Training Area (PTA) is the largest Army training area in Hawai‘i, totaling 108,792 acres. Land uses surrounding PTA include cattle grazing, game management, forest reserves, and undeveloped land.

Air pollution levels in Hawai‘i generally are low due to the small size and isolated location of the state. Therefore, upwind areas do not contribute significant background pollution levels. The entire state is in attainment with federal ambient air quality standards.

The most prominent feature of the circulation of air across the tropical Pacific is the persistent trade wind flow in a general east to west direction. The trade winds blow across Hawai‘i primarily from the northeast throughout the year with the windiest months being from May through September. Wind patterns are also influenced by major storm systems and by topographic features that alter or channel prevailing wind directions. Topographic features have additional influences on local wind patterns in coastal areas.

Limited seasonal changes and a dominant trade wind pattern limit seasonal variations in weather conditions in Hawai‘i. Weather conditions show a two-season pattern, with a winter season of seven months (October – April) and a summer season of five months (May – September). The summer months are generally warmer and drier than the winter months. Seasonal variations in temperature conditions are mild at lower elevations with daytime temperatures commonly between 75° F – 85° F and nighttime temperatures from 65° F – 75° F.

Topographic features exert a strong influence on rainfall amounts and also influence temperature patterns at higher elevations. Rainfall amounts range from less than 20 inches per year on the southern and western coastal areas to over 30 inches per year on the windward slops of the high mountains or near the summits of lower mountains on Kaua‘i, O‘ahu, and Maui. PTA experiences a rain-shadow effect caused by adjacent mountain ranges, which alters the vegetation characteristics of the installation from rainforest to tropical steppe.

The uneven distribution of rainfall on O‘ahu has implications for surface water runoff and groundwater recharge. The upper portion of each watershed can receive significantly more rainfall in a given storm than the lower portion. Many of the watersheds on the islands are small, and there is often little storage capacity, resulting in quick runoff during events. Surface water drainage is defined by watershed boundaries instead of groundwater aquifer boundaries.

On Hawai‘i, the permeability of young volcanic deposits is very high. Therefore, little to no runoff occurs and channels are not well defined, except along the northern windward

coast of the island. Hawaiian clay and silty clay loam soils reportedly have high infiltration rates, perhaps higher than some sandy soils found on the continental US. This may be due in part to the soil structure and formation of cracks that absorb moisture rapidly.

The sedimentary rocks of O‘ahu include both terrestrial and marine deposits. A caprock of stratified marine sedimentary deposits interspersed with volcanic rocks overlies the coastal plain at the north and south ends of O‘ahu. This bedrock is relatively impermeable and traps groundwater in the basal aquifer system below it.

Terrestrial sedimentary deposits consist of alluvium deposited by streams, rock material, deposited at the foot of slopes, and mixed erosional deposits called colluvium. Alluvium derived from weathered basalt tends to have a higher clay content and low permeability. Soil types present in the Hawaiian Islands vary greatly because of local climate, slope, drainage, and age of island. Eleven soil orders are found in the islands.

The isolated nature and volcanic origin of the Hawaiian Islands has resulted in a unique diversity of habitats and species. Over 90% of the native species of plants and animals are endemic. Nonnative species have threatened the ecosystems. Hawai‘i and O‘ahu have both lost a great deal of native natural diversity.

Areas of habitat considered essential to the conservation of a listed endangered or threatened species may be designated as critical and are protected under the Endangered Species Act. Army training areas were excluded from being designated critical habitat because of the essential contribution that Army-led natural resource conservation plays in the recovery of threatened and endangered species. These contributions include ongoing and proposed management actions specified in the INRMPs for Schofield Barracks and PTA.

3.2 Threatened and Endangered Species (TES)

Army installations are home to a variety of threatened and endangered species (TES). TES information on Army installations is tabulated yearly; most recently in *Final Installation Summaries from the FY 2004 Survey of Threatened and Endangered Species on Army Lands* (USAEC, 2005).

As of 1 October 2004, the Army has recorded 177 federally Threatened and Endangered (TES) species on 100 installations and 251 Species at Risk on (or adjacent to) 72 installations. The Army also has 15 installations with designated critical habitat occurring for one or more species, and five (5) installations with unoccupied critical habitat. The detailed data have been sorted by installation, scientific name and common name (USAEC, 2005). A total of 205 different TES (396 occurrences) were identified by 121 of the 127 installations that reported having onsite or contiguous Threatened, Endangered, Proposed, or Candidate (TEPC) species. Of the 121 installations, 100 reported having onsite TES. The remaining 21 installations reported having only contiguous TES. Of the 205 TES, 177 species occurred onsite, and the remaining 28 species were reported as being contiguous to at least one installation, and onsite at none.

The bald eagle was the most commonly reported TES on Army installations. Fifty-three installations reported the bald eagle, of which 44 were identified onsite. Sixteen of the installations recorded the bald eagle as the only TES found onsite. The red-cockaded woodpecker was second, with 11 installations reporting it onsite or contiguous. Ten installations reported the Indiana bat on them or contiguous.

Pacific Region installations have the most TES recorded onsite, the maximum at Makua Military Reservation with 33 T&E species, followed by Schofield Barracks with 28, Kawailoa Training Area with 27, and Pōhakuloa Training Area with 18. A distant fifth is Camp Blanding with eight followed by Fort Stewart and Fort Hunter Liggett with six.

A total of 31 distinct Candidate species were identified from the 127 installations that reported having onsite or contiguous TEPC species. No installations reported having proposed species. A total of 21 installations reported having Candidate species on or contiguous to them. Six of these installations reported having only Candidate species on (or contiguous to) their installation. One installation had only a single contiguous Candidate species. All the 31 distinct Candidate species identified on Army lands occurred within at least one installation's boundary.

3.3 Land Use

The Proposed Action will affect areas currently used for training purposes, including live-fire exercises.

3.4 Cultural Resources

A wide variety of cultural resources are found on Army installations. Significant properties are classified as buildings, sites, districts, structures, or objects. Buildings were primarily constructed for human activity. Structures usually were constructed for purposes other than shelter. Objects are principally artistic in nature or relatively small in scale. Sites are often the location of a valued significant event, prehistoric or historic occupation or activity, or a standing location that possesses those values. Sites may also be natural landmarks strongly associated with significant prehistoric or historic events or patterns or events. Districts typically are a significant concentration or continuity of sites, buildings, structures and objects.

Installations operate under an ICRMP, a 5-year plan for compliance with the requirements of Army Regulation 200-4 (AR 200-4), Cultural Resources Management. The ICRMP is an internal Army compliance and management plans that integrate the entire installation cultural resources management program with ongoing mission activities, including standard targetry replacement. AR 200-4 covers Army compliance with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, the Archeological Resources Protection Act, the Archeological and Historic Preservation Act and other federal and state regulations.

3.5 Air Quality

Air quality varies from installation to installation. Some installations are located in areas that meet or exceed federal and state standards for air quality; others may be located in non-attainment areas that exceed the National Ambient Air Quality Standards (NAAQS) for five criteria pollutants (particulate matter, nitrogen dioxide, carbon monoxide, sulfur dioxide, and ozone). Lead is another monitored air quality pollutant. The Clean Air Act, as amended, requires the formulation of National Emissions Standards for Hazardous Air Pollutants, frequently called air toxins.

Other NAAQS exist for sulfur dioxide, carbon monoxide, lead, and nitrogen oxides. These pollutants result from combustion sources, vehicle engines and obscurant generators. The Environmental Protection Agency (EPA) has also established a new NAAQS for ozone. Ozone is not normally emitted, but is a product of the reaction between volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the atmosphere; thus controlling emissions of VOCs and NOx mitigates ozone pollution. Emissions of NO_x also come from vehicle and generator exhausts.

3.6 Water Quality

Water quality also varies from installation to installation. Installations monitor surface water, drinking water, wetlands, and groundwater, all part of an installation's overall water program. Surface water and waterways, either permanent or transient/seasonal, may be considered waters of the United States as defined by and protected under Section 404 of the Clean Water Act.

3.7 Noise

Noise can be defined as unwanted sound that interferes with normal human activities. The basic unit used to measure sound levels is the decibel. In order to quantify the intrusive nature of nighttime noise, the Environmental Protection Agency recommends a 24-hour average, known as the day-night level, be calculated by adding an additional 10 decibels to noises occurring between 10:00 PM and 7:00 AM. High sound levels are part of range operations and a necessary training condition, since soldiers must learn to function in an environment similar to that encountered on the battlefield. Noise can also disturb wildlife populations or disrupt breeding cycles.

3.8 Solid Waste

The normal operation of ranges includes the removal of targets that are damaged, unusable, or have exceeded their service life; and their disposal becomes part of on-going installation solid waste management. If the targetry debris is non-hazardous, it may be considered solid waste and disposed of in the installation landfill, if such debris is normally accepted at the landfill. Alternately, it may be incorporated into installation recycling and reuse efforts, if feasible. If range debris is contaminated and/or deemed hazardous, it must undergo proper disposal.

3.9 Hazardous Materials and Used Oil

Standard targetry replacement includes the replacement of obsolete or malfunctioning targetry systems such as lifters. In some older lifters, hydraulic units were used to operate the system. Newer lifter systems require less hydraulic fluid than older systems. Typical replacement involves removing one unit and inserting a newer one in the same spot, without having to perform additional excavation. Disposal of the old unit is then accomplished in accordance with installation guidelines. Other potential hazardous materials that are currently used on training ranges include fuel, motor oils, and anti-freeze from motor vehicles, as well as ordnance and pyrotechnics used for training purposes.

3.10 Aesthetic Resources

Aesthetic, or visual, resources consist of the natural (and possibly) man-made landscape features that appear indigenous to the area, and provide the aesthetic qualities of a particular environment. The aesthetics of Army training ranges are based on local environments and are therefore just as varied.

3.11 Socioeconomics

Socioeconomics is the study of the social and economic impacts of any product or service offering, market intervention or other activity on an economy as a whole and on the companies, organization and individuals who are its main economic actors. These effects can usually be measured in economic and statistical terms, such as growth in the size of the economy, the number of jobs created (or destroyed), or levels of home ownership or Internet penetration; and in measurable social terms such as life expectancy or levels of education. The Proposed Action will take place on several Army installations that are located adjacent to or within Metropolitan Statistical Areas that serve the Region of Influence for evaluating socioeconomics.

3.12 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations requires the Army to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks requires the Army to identify and assess environmental health and safety risks that may disproportionately affect children and address such risks in its policies, programs, activities, and standards. Agencies must conduct an evaluation of environmental health and safety effects on children and include an explanation of why the planned regulation is preferable to other potentially effective and feasible alternatives considered by the agency for all regulatory section of this Executive Order.

The Proposed Action takes place on training ranges that are typically located within the live-fire areas of Army installations. These areas are restricted from the general public and development is confined to military training activities.

4.0 ENVIRONMENTAL CONSEQUENCES

Each installation has a unique locale, with unique environmental concerns. While some settings (regions) are more robust than others, this Proposed Action, as defined, should have similar impacts in any region. These impacts are analyzed in the following sections of this PEA, any such common effects will be identified and evaluated, and special conditions that could require site-specific analyses will be identified, for additional and more-detailed consideration/review by the individual project proponent (installation, installation management agency, or the major command). This procedural review can be used to determine if the proposed targetry replacement will warrant further analysis and investigation, based on the completion of the targetry replacement REC checklist (Appendix A). The following analyses constitute the first tier of such determination, and may be sufficient, and, if required, should be used to provide focus to any subsequent required analyses, as well as a procedural framework for further evaluation.

4.1 Natural Resources, Geology, and Soils

Active Army ranges already operate within a natural environment, which includes plant and animal species, and an established community of both have developed near and adjacent to the ranges. Over the years, compatibility between these range operations and these species (including TES) has been established. In fact, the viability of many sensitive species depends on the continued Army land use, and active Army stewardship. Ideally, the active portions of ranges are situated away from TES habitat; but, in practice, however, this is often infeasible, and installation commanders must balance both (1) the Army mission requirements and (2) Army responsibilities as environmental stewards. During the replacement activity phase of the Proposed Action, when targets are being replaced, any existing wildlife would disperse, away from the area being disturbed. This dispersal would be temporary and represent an insignificant impact to natural resources, as any animals would likely return to their established territories or habitat, once replacement work on targets is completed, much as they do during the current use of these ranges. These displacements would be less severe than those associated with the past and ongoing use of these ranges, as the actions are less disruptive than those often associated with actual range use, and the existing species have become accustomed to a much larger threshold of disruption. Although any established plant species around targetry embankments could experience minor displacement, their overall diversity may actually benefit. The actual impacted area will be small in size and in all likelihood will have been recently and routinely disturbed through simple maintenance of existing range targetry.

While these general effects will occur, their severity and potential significance will be different from installation to installation. As discussed earlier, some of the natural resources are more resilient than others. For example, southeastern US ecosystems are more diverse and resilient, and can quickly recovery from stresses and disruptions, while the southwestern US ecosystems are much more fragile and require more time for recovery, and the effects are likely to last longer. Other potentially affected ecosystems

recover at a slower or faster rate, depending on natural resilience, and the other stresses on the affected landscape (for example, cattle grazing leases on installations). In all cases, the potential effects of the targetry upgrades are comparable if not less than the effects associated with normal range operations.

Through regular correspondence between the natural resources and range control staffs, impacts to natural resources within and adjacent to training ranges can be minimized. The INRMP serves as guidance for effectively managing natural resources on an installation, while maintaining optimal mission efficiency.

Soil erosion, a natural process, is accelerated by construction and military activities, and undermines the natural environment to support the Army mission. Once the erosion process has started, the direct effects usually cannot be reversed. The most important sources of soil erosion are construction and off-road vehicle traffic. Construction impacts are similar to comparable civilian projects, while military unique stresses are the subject of considerable on-going Army research (Anderson, *et al*, 2005), which supports evolving Army policies and management to reduce soil erosion and indirect effects such as sedimentation in streams, stream turbidity, effects on aquatic species, etc. Such impacts are managed through the ITAM program (US Department of the Army, 1998) and associated guidance. Army Regulation (AR) 350-4, "Integrated Training Area Management." establishes the objectives, responsibilities, and policies for the Army's ITAM Program to achieve optimum and sustainable use of Army training lands. This comprehensive program, implementing a uniform land management regimen, includes the periodic inventory and monitoring of land conditions, integration or training requirements with land carrying capacity, education of land users to minimize adverse impacts, and the provision of required training land rehabilitation and maintenance. Army ITAM procedures (US Department of the Army, 1999) describe how each ITAM component contributes to the overall sustainability of a well-trained and equipped combat force, through sound environmental stewardship of natural and cultural resources on lands under the control of the Army. The ITAM Five-year Plan (KSU, 2002) identifies, over the long-term, installation funding requirements for the sustainment of its ranges. This plan becomes a tool to assist the ITAM Coordinator in the production of the Installation Workplan Analysis Module, and provides the supporting justification for ITAM requirements. Army technical guidance (US Department of the Army, 1999) provides information for ITAM Installations to implement a successful range program, one that provides scientifically valid baseline and long-term monitoring data.

Recognizing that the management of single training events had historically proven inadequate to sustain these ranges over time, this more comprehensive approach focuses on '"carrying capacity" of the land (total stresses on these ranges) and the relationship between use (maneuver impact miles), condition of the land, and required maintenance to meet desired goals. The Army approach focuses on the cumulative erosion conditions on the training lands, eliminating the previous "event by event" approach to land management. This approach has been articulated in installation guidelines (US Department of the Army, 1999) which (1) estimate training land carrying

capacity, to support maintenance and optimal use for realistic training, and (2) establish mechanisms predict and secure required land rehabilitation and maintenance requirements, based on training usage. This approach insures the active and ongoing characterization of the issues and allows for analysis of stresses, thresholds, and cause-effect mechanisms. It also evaluates the establishment of baseline conditions, analysis of the magnitude and significance of effects, mitigation design and implementation. Finally, this approach allows for monitoring of predicted effects. As part of the research that supports the ITAM program, considerable military specific research has been accomplished (Grein, 1997, Skidmore, *et al*, 2002, and Riggins, 1981). In addition, much of this research has addressed some of the indirect effects of soil erosion (Riggins, 1984 and 1989). The Army approach has expanded to include establishing stress thresholds based upon the ability of the landscape, under various conditions, to support levels or intensities of military stress (Anderson, *et al*, 1999, Sullivan, *et al*, 2000, van Donk, *et al*, 2003, and MacAllister, *et al*, 2003). The long-term Army range maintenance policies and guidelines constitute a proactive approach. Supported by considerable Army research on the fundamental mechanisms for analyzing such significance (Vaughn, 1983 and Riggins, 1979), the concept of "carrying capacity" can now be used to eliminate major (significant) impacts by managing training stresses on the landscape (Anderson, *et al*, 1999, Sullivan, *et al*, 2000, van Donk, *et al*, 2003, MacAllister, *et al*, 2003).

The cause-effect relationships for indirect soil erosion impacts, while still well established in the literature, are less well developed and are likely to be very site specific, as the mechanisms are often framed by the specific environmental setting. However, some of these relationships have been documented (Riggins, 1984 and 1989), and are available for general use. In the case of air quality and water quality issues: from wind and water erosion, respectively, relevant and pragmatic applications of cause and effect mechanisms are readily accomplished. The impacts on biological resources are less well defined, in terms of cause-effect. Animal species respond differently to the indirect effects of soil erosion, including effects on habitats. The response of wildlife is less known, and some may have considerable resilience to such effects; though aquatic (or stream-oriented) species are more likely affected. Some of these species are less tolerant, particularly during specific periods (mating, birthing, etc.). Tertiary effects result in population-level changes, including increased mortality, reduced reproductive rate, or habitat abandonment. Figure 1 on the following pages demonstrates the "network" representation of soil erosion. It can be useful in appreciating the cause and effect relationship and the value of soil erosion prevention.

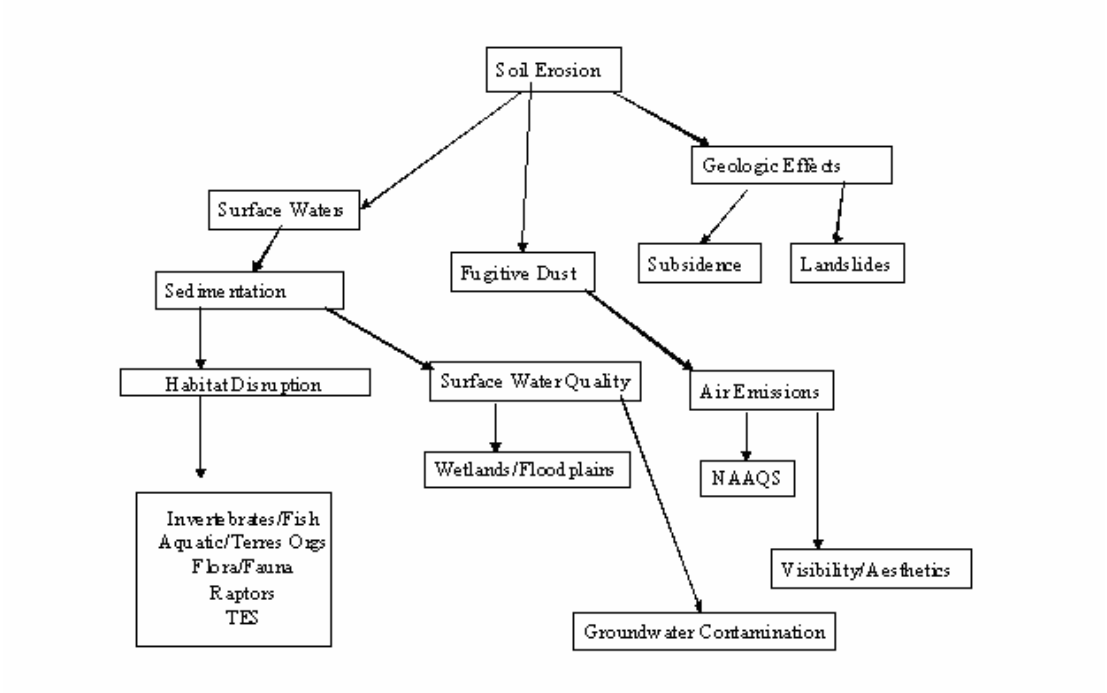

Figure 1: Soil Erosion Effects

While the geographic scope of direct soil erosion impacts is very localized, limited to the actual construction or training site of the proposed action, the indirect effects of water and wind erosion is felt in the "downstream" watershed, following the effects of soil sediments as far as they are felt (are measurable) or the airshed, respectively.

Soil erosion effects are generated by a variety of Army actions, but are similar, to a large extent, to the same soil erosion effects associated with civilian activities and their impacts. The Army processes affect soils in the same general manner: surface vegetation is removed, soil particles are subsequently dislodged (by wind or water), and the transport of these soil particles creates numerous indirect (or secondary) effects. These indirect effects are generally more important than the direct effect (the actual soil erosion) as they often constitute environmental issues important to regional stakeholders. Direct and indirect soil erosion impacts are best addressed early in the erosion cause-effect process, prior to the dislodging and transport of soil particles as sediment.

When disruption of the vegetative cover and soil surface is inevitable (as with many construction activities), soil erosion can often be contained using Best Management Practices (BMPs).

The fundamental geology and soils of a range should not be significantly altered as a result of standard targetry replacement. The Proposed Action does not entail large-scale excavations or disruptions, or soil deposition on training ranges and associated drainage-ways. Any dust generation would be temporary and localized. If extensive ground disturbance occurs, beyond that stated within the scope of this PEA, further

environmental analysis may be required. For example, installations in the southwest (or other geographic areas where friable soils are of special interest) would follow established BMPs to contain surface runoff and sediments, as well as dust suppression efforts to minimize any fugitive dust.

The condition of the site will be characterized, and if the quality of cover vegetation is poor, or if erosion features are prominent, steps will be taken to improve these conditions and address ongoing erosion, as part of the targetry replacement. These improvements will be made in accordance with the referenced BMPs in the Appendix. In this regard, the targetry replacement may improve the overall environmental quality on the range, arresting impacts that, while often minor, are ongoing.

If the No Action Alternative is implemented, the baseline condition of the range's geology and soils will not be affected. The ranges will continue to be used on a regular basis, which will increase their overall erosion. However, BMPs and sustainment measures by the ITAM and Land Rehabilitation and Management (LRAM) staff, in coordination with the environmental staff, will continue.

4.2 Threatened and Endangered Species

The Proposed Action similarly impacts TES, as a component of the impacted natural environment. Due to their importance and sensitivity, TES habitats will, as much as practicable, be avoided. This will be accomplished through close coordination with the installation environmental office, and through any required consultation with the US Fish and Wildlife Service, to ensure that standard targetry replacement will not jeopardize the continued existence of any TES, or adversely modify critical habitat. If potential impacts are identified, the installation will coordinate with the US Fish and Wildlife Service to determine the magnitude of the potential impacts, as well as potential steps to reduce or eliminate potential impacts on TES, such as mitigations, modification of training, or other required steps.

Neither the Proposed Action nor the No Action Alternative should result in a significant impact to TES at participating installations or on adjacent properties. As with other species, displaced animal TES are likely to return to their original habitats and will not suffer any long-term adverse impacts if the Proposed Action is implemented. If TES are found in the proximity of established targetry, Range Control staff will coordinate standard targetry replacement around the breeding and nesting seasons to minimize potential impacts, closely coordinating with the installation environmental staff and regulatory agencies.

In practice, new targetry should not be placed in the vicinity of plant TES. If plant TES are discovered near established targetry, Range Control staff can minimize effects to TES by adhering to policies and procedures defined in the INRMP and/or the ESMP. The No Action Alternative includes performing current range maintenance activities without changing standard operating procedures, and the Proposed Action does not

include major changes to current range operations. Therefore, the Proposed Action should not pose a significant impact to natural resources at host installations.

4.3 Land Use and Planning

If the Proposed Action is implemented without proper land use considerations, the viability and usefulness of a training range can be severely diminished. Existing land use conflicts may limit the utility of a range, and targetry replacement will not improve range utility in such cases. In some cases, the quality of Army training lands has already decreased over time, and those installations with deteriorated land use must consider appropriate steps to ameliorate such conflicts. These steps include proper site-specific techniques to remove and dispose of used targets, to both minimize unnecessary land disturbance and promote compatible adjacent land use patterns. BMPs with regards to land use are helpful in reducing potential impacts. Those BMPs related to land use and planning also apply to mitigation efforts for the No Action Alternative.

4.4 Cultural Resources

In rare cases, the operation or maintenance of a range could encounter (and potentially impact) cultural resources pursuant to the Archeological Resources Protection Act, Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, or the National Historic Preservation Act of 1966, as amended. While a range that would be considered historically significant might warrant focused consideration, the re-use of range property for continued operation is common practice throughout the Army, and may not be an adverse effect under 36 CFR Part 800, "Protection of Historic Properties". Installation Range Control staff must coordinate standard targetry replacement with the installation cultural resources staff and comply with the installation ICRMP.

Prior to any ground-disturbing activities in the project area, all previously recorded cultural resources must be inspected and their present conditions assessed. Non-surveyed portions of project areas must be surveyed prior to any ground-disturbing activities, and significant cultural resources will be avoided. Immediately upon locating cultural resources, the installation Archeological Officer will be notified. The Archeological Officer will assume responsibility for coordinating with the State Historic Preservation Officer to determine effects and mitigation plans. This will ensure compliance with Section 106 of the National Historic Preservation Act. As the majority of targetry replacement activities will occur on previously disturbed sites, no significant impact on cultural resources is anticipated as a result of standard targetry replacement. If the No Action Alternative is implemented, no significant impact to the installation’s cultural resources is expected. Range operations staff will continue to coordinate activities on ranges with the installation’s cultural resources staff.

4.5 Air Quality

The Clean Air Act establishes National Ambient Air Quality Standards (NAAQS) (40 CFR 50) for certain criteria pollutants (*i.e.* particulate matter (PM), ozone, sulfur dioxide, carbon monoxide, lead, and nitrogen oxides), setting an upper limit on the permissible concentration of these pollutants (including PM_{10} and $PM_{2.5}$ - PM less than or equal to 10 and 2.5μm in aerodynamic diameter, respectively) in the ambient air. The EPA established a NAAQS for $PM_{2.5}$ (PM less than or equal to 2.5 μm in aerodynamic diameter). Individual states must have state implementation plans to maintain those standards, directly controlling sources of these pollutants. Generic (general) regulations often address opacity (visible emissions), odor, and emission rates. Opacity is a surrogate for identifying sources with excessive PM emissions.

The Proposed Action may result in incidental emissions from fugitive dust, and vehicle and generator exhausts. Fugitive dust may be more prevalent in drier climates, such as the desert southwest, or other regions where soils are more susceptible to erosion. BMPs for dust suppression should mitigate any fugitive dust. It is not expected that the Proposed Action would significantly increase emissions of these pollutants. While emissions during training are expected to cause short-term adverse impacts to air quality, the significance of such impacts needs to be determined by local conditions (*i.e.* meteorological conditions, distance to boundaries from ranges, etc.). Final estimates must be based on the proposed implementation of targetry upgrade at the participating installation.

States are the primary regulator of ambient air quality. The severity and significance of any impacts will largely depend upon the air region's current compliance with NAAQS. If the installation is in an "attainment" area, the effects of the proposed action will be minor. If in a "non-attainment" area, further analyses will be required for the exceeded NAAQS, and some collaboration with state regulators must be initiated determine allowable rates of emissions and compliance monitoring methods. Installations already maintain appropriate programs to insure and document compliance with local and state air quality requirements, and these on-going efforts should prove sufficient. In some cases, site-specific analyses, and further coordination with federal, state and local regulators, may be required. Such regulations include those addressing visible emissions, particulate emissions, and VOC emissions; and applicability will be a site-specific, local determination. Prior to any standard targetry replacement, the installation air quality program manager will be consulted to determine if appropriate permits, permit modifications, or notifications are required.

While specific procedures may be required in non-attainment areas, targetry replacement requires a relatively small level of activity, and often in a remote location (relative to civilian or other human receptors). As a result, the Proposed Action will not result in a noticeable decrease in air quality. Low levels of fugitive dust can be expected, but such increases or impacts on ambient air quality would be short-term and are expected to be insignificant. The installation environmental staff can ascertain the need for any permits or notifications. If mitigation methods, such as dust suppression to minimize particulate matter are required, standard construction practices, including

BMPs and Standard Operating Procedures (SOPs) will be used to control fugitive dust. The Installation air quality manager can provide additional guidance.

Under the No Action Alternative, the baseline conditions of the installation's air quality would not change. Therefore, no new impacts would be expected as a result of implementing the No Action Alternative.

4.6 Water Quality

The Proposed Action should not pose a significant impact to the host installation's groundwater or drinking water quality; or violate the Clean Water Act, as amended. The installation environmental staff can evaluate the need for a storm water construction permit for any disturbed areas of one acre or greater. As standard targetry replacement does not include construction activities greater than five acres, no National Pollution Discharge Elimination System permit or storm water pollution prevention plan should be required. However, care should be taken to ensure that no spills or accidental releases occur, and to eliminate infiltration of any contaminants (hydraulic fluids, etc.) into groundwater during replacement work, through the use of appropriate BMPs. The installation water program manager will be consulted prior to initiating standard targetry replacement.

There should be no effect on water quality if the No Action Alternative is implemented, as current practices would continue. If targetry replacement involves more than five acres of construction, a general storm water construction permit will be required. The purpose of the permit is to prevent degradation of the water quality downstream, particularly from sedimentation due to soil erosion from construction areas. The permit requires preparation of a storm water pollution prevention plan that would incorporate standard erosion control features such as silt fences, erosion control blankets, or diversions.

4.7 Noise

The Proposed Action does not require any activities that would exceed the baseline noise levels of these exiting training ranges. In addition, these ranges are typically located in designated military training areas, and their significant noise effects do not extend to land uses inhabited by people. Noise levels in these areas are typical of normal background levels in a natural setting except during active training. Since training noise can be expected, regardless of the Proposed Action, it will represent baseline conditions for purposes of this PEA.

The Proposed Action supports training by different units on the same range. Therefore, standard targetry replacement should be coordinated with the environmental office. If either the Proposed Action or the No Action Alternative is implemented, the baseline noise levels will remain the same. Therefore, no significant change is anticipated.

4.8 Solid Waste

Debris resulting from standard targetry replacement may or may not be eligible for disposal as part of the installation's solid waste management program (whether an installation landfill (Army or contracted), or a landfill shared with a municipality or local government. These wastes will be coordinated with the installation solid waste management staff to determine proper disposal procedures. Neither the Proposed Action nor the No Action Alternative should result in a significant increase to the installation's solid waste stream.

4.9 Hazardous Materials and Used Oil

If a hydraulic lifter station is damaged during replacement, a release of hydraulic fluids is possible. Such fluids are normally considered hazardous materials/wastes; and, therefore, proper replacement techniques and BMPs should be followed to minimize any likelihood of such releases/spills and to contain them if they occur. These BMPs would include the provision for spill containment supplies, readily available during replacement, and proper disposal of contaminated supplies and materials. These should be coordinated through the installation classification unit and part of the installation Spill Prevention Control and Countermeasures Plan (SPCCP).

The risk of any release of hazardous materials into the environment will remain the same if the No Action alternative is implemented, since the level of operational training activities would not change. Proper techniques for lifter and used targetry replacement and disposal should be followed.

4.10 Aesthetic Resources

Visual aesthetics of a range should not be significantly impacted as a result of standard targetry replacement. While areas of a range may be cleared to facilitate work on targets and mechanisms, the overall appearance of the range after such improvements should not be altered. Standard targetry replacement should not interfere with BMPs of the Range Control ITAM and LRAM staff. These practices should improve or at least maintain the overall quality of the range. As a range matures, its overall appearance should not be affected. While some vegetation is lost due to use, restoration and sustainment, practices should maintain the overall aesthetic quality of the range.

If no action were taken, the visual aesthetics of the ranges would remain consistent. There should not be a noticeable difference in the aesthetic quality of a range when compared to the Proposed Action. Current range maintenance operations should continue to be coordinated with the installation ITAM and LRAM staff.

4.11 Socioeconomics

The Proposed Action is confined to training ranges located within the live fire area of Army installations. This activity is routinely carried out by the Installation Range Control Office and therefore, no impact to local socioeconomics is anticipated.

4.12 Environmental Justice

The Proposed Action is limited to training ranges on Army Installations. These ranges are generally restricted from general public access. Therefore, no Environmental Justice impacts are anticipated.

4.13 Cumulative Effects

Analysis of Cumulative Effects in Programmatic Analyses

Cumulative impacts and issues are increasingly important as they often create greater impacts than those direct and indirect effects of singular proposed actions. As articulated in the CEQ guidelines (CEQ, 1997a) and Army guidance (Canter, *et al*, 2005), cumulative effects analysis (CEA) must focus on important regional resources, as opposed to the traditional "action impact" paradigm used to address direct and indirect impacts; focusing on the resources or valued environmental components (VECs) that are important in a specific region. The identification of cumulative VECs is independent of a particular proposed project or action. Once identified, the cumulative effects on these VECs can be readily accomplished.

This regionally specific VEC paradigm is challenging in Army "programmatic" documents that address geographically diverse projects, which are often independent of a specific location. Though direct and indirect effects can be addressed in a programmatic way, but CEA analyses will inevitably require site-specific consideration. Programmatic Army documents can present summary analyses of direct and indirect effects, which can be used to ascertain the need to further CEA at a specific installation.

CEQ regulations (CEQ, 1978) and guidance (CEQ, 1997) define cumulative impacts, as follows:

> Cumulative impact is the cumulative effect on the environment that results from the incremental impact of the action when added to "other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions". Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

This definition prompts (a) consideration of the incremental impacts of Army action relative to other actions; (b) an expanded time frame, extending from the past to the future; (c) larger study areas, encompassing more actions that could also affect important resources; (d) consideration of multiple actions from multiple public and private sector sources; and (e) determination of cumulative significance of incremental impacts of the proposed action.

The CEQ approach for CEA is based on eight principles (CEQ, 1997a), and specific components of those principles can guide programmatic application in a programmatic application useful:

- CEs are the total effect, including both direct and indirect effects, on a given VEC, no matter who (federal, non-federal, or private) performs the actions.

- CEs must address VECs directly or indirectly affected by the proposed action. If the action has no such effects, further CEA on the VEC is not required.

- CEs must be analyzed from a site-based perspective, and on the VECs being affected.

- Each VEC must be analyzed in terms of its capacity to accommodate additional effects, based on its own time and space parameters (This infers site-specific consideration of carrying capacity and environmental sustainability of each subject VEC).

These components of the CEQ CEA principles support (a) CEA analyses of issues for which direct and indirect effects are identified; and (b) required CEA must be regionally specific.

CEQ establishes 11 steps for CEA (CEQ, 1997):

Step 1: Identification of significant cumulative effects issues associated with the proposed action and definition of assessment goals.

Step 2: Establishment of the geographic scope for the analysis.

Step 3: Establishment of the time frame for the analysis.

Step 4: Identification of other actions affecting the resources, ecosystems, and human communities (VECs) of concern.

Steps 5 and 6: Characterization of the resources, ecosystems, and human communities (VECs) (identified in Steps 1 through 4), in terms of their response to change and capacity to withstand stresses; and characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds.

Step 7: Definition of the baseline condition for the resources, ecosystems, and human communities (VECs).

Step 8: Identification of the important cause and effect relationships between human activities and resources, ecosystems, and human communities (VECs).

Step 9: Determination of the magnitude and significance of cumulative effects on the selected VECs.

Step 10: Modification or addition of alternatives to avoid, minimize, or mitigate significant cumulative effects.

Step 11: Monitoring of the cumulative effects of the proposed action and adaptation of management.

These steps are required if direct or indirect effects are identified, and if the identified effects are on regionally important VECs. Although these direct and indirect impacts are determined insignificant, they require further evaluation for potential contributions (even though insignificant) to cumulative impacts on the resource, or VEC. This concept is at the heart of the definition of cumulative impacts. As articulated in the Army CEA guidance (Canter, *et al*, 2005), three levels of CEA can be used to evaluate resources (VECs); (a) Quick Look, (b) Analysis and Discussion, and (c) Detailed Analysis. The level of analysis is based on "Quick Look" questions (Canter *et al* 2005). These were initially developed to easily screen subject VECs and ascertain if detailed CEA is justified. If the answers to the Quick Look questions imply that the likelihood of significant cumulative impacts is quite small, no further analysis is necessary (Canter *et al* 2005). However, in practice, many of these questions cannot be readily answered, and more detailed attention is required to address potential effects, using a second level analysis (Analysis and Discussion). Issues that had definite, potentially significant incremental impacts required more rigorous, analytical analysis (Detailed Analysis). In the case of programmatic documents, two overarching determinations can be used:

(1) Are their any impacts (even minor) on a given VEC?

(2) Is the VEC regionally significant?

The "Quick Look" Level – If the answers indicate that likely impacts are quite small, or can be mitigated, and will unlikely contribute to significant cumulative impacts on the VEC; an EA-level of documentation is required. This "hard look" required by NEPA need not be extensive or costly; and can be quite brief (32 CFR 651).

The Analysis and Discussion Level – Additional analyses may be required to completely answer the questions, and should be more completely documented, again at the EA-level of analysis "in proportion to the nature and severity of the issues addressed; and they should focus on those issues that interest the decision maker and the public" (32 CFR 651). This will likely require some consideration of CEQ Steps 1 – 4, 6 and 7.

Detailed Analysis - If the EA-level analyses identify any direct or indirect effects that cannot be mitigated, or could contribute to cumulative effects, a more rigorous CEA is required, and should be evaluated at an EIS-level of analysis, addressing all 11 CEQ steps). The most detailed level of analysis does not automatically trigger the need for an EIS, but the likelihood of significant effects is greatly increased. The eventual need

for an EIS is still determined though the EA process, as the significance of potential impacts is determined.

In application of the CEA guidelines to date, the regional sensitivity (importance) of specific VECs has proven very important at the "Quick Look" level of analysis and the "Analysis and Discussion" level as well. Certainly, if impacts are minor, and the affected VEC is unimportant, the need for further analyses could be appropriately discounted. Thus, the need for CEA would depend more on the importance of the VEC than the magnitude and significance of the direct and indirect impacts.

To enable this part of the analysis, an installation could "pre-screen" potentially affected VECs, prior to any specific analysis. This could be accomplished through a review of installation EISs and major EAs, but should also include similar data sources within the broader region (for example, NEPA documents produced by other agencies in the region). Such documented review could produce a defendable summary of regionally sensitive VECs, and provide a systematic, defensible means to address to both the Quick Look and, if needed, Analysis and Discussion.

A quick, obvious source of such analysis would include current installation EISs/EAs; but a credible regional analysis must include an analysis of issues identified by other agencies (including other DoD entities). The Northwestern University NEPA Repository can be queried online; potentially relevant documents can be identified and obtained, and regionally specific lists of important VECs or matrices linking specific regional activities to important VECs can be developed. Such analysis can be limited to recent EISs to meet the immediate need to identify important VECs; or it can be all-inclusive to better categorize "past" actions in the region that have affected all VECs as required by CEQ Step 4: Identification of other actions affecting the resources, ecosystems, and human communities (VECs) of concern.

If such analyses are done, several "lessons learned" (from previous such studies) should be applied:

(1) A broad regional definition should be used; as analysis (including CEA) should follow the impacts, and impacts follow drainages, airsheds, and other features (not political boundaries).

(2) VEC terminology and definitions (as well as activity terminology and definitions, if a matrix is being developed) should be defined and refined as the analysis process unfolds, in order to capture minor, yet important variations.

(3) As the analysis is regionally specific, the VECs can be more detailed (*i.e.* a specific stream or watershed, instead of a general VEC such as “stream water quality”), as many issues are localized (a specific resource).

(4) Specific references or mitigations (in the subject EISs) should be captured for future installation use; as these two components of a NEPA document may be more generally applicable.

Once such analyses are completed, programmatic analyses (direct and indirect effects) can be evaluated regarding their contribution to important VECs in the region. If the impacts are minor (insignificant) and the affected VEC is unimportant, a "Quick Look" approach will suffice. If impacts are minor and the affected VEC is important, an "Analysis and Discussion" approach is required, which may prove adequate (or lead to detailed analysis, if warranted). As required in sections 651.16(b) and (c) of the Army's NEPA regulations (USA, 2002), public scoping can be also be used to identify regionally specific VECs, particularly if potentially significant impacts justify an EIS.

CEA Requirements for this PEA

Typically, ranges are constructed in areas that are reserved for military training operations. Newer ranges are typically built over existing ranges, or existing ranges are modified to accommodate a newer range's mission. Implementation of either the Proposed Action or the No Action Alternative will not result in a fundamental change to range operations.

Given the minor direct and indirect impact implications of targetry replacement, the isolated nature of Army ranges, and very small risk of migrating effects; the need for CEA analysis will be rare.

If, as a result of additional, site-specific review, any impacts become potentially more severe, the specific environmental impact (direct or indirect) must be further evaluated in lieu of its contribution to a potentially significant cumulative impact, when added to other past, present, and reasonably foreseeable future actions. To guide this site-specific determination, the following paragraphs can be used.

4.13.1 Natural Resources, Geology, and Soils

Over the years, compatibility between these range operations and resident species (including TES) has been established; and the viability of many sensitive species depends on the continued Army land use, and active Army stewardship. During the replacement activity phase of the Proposed Action, when targets are being replaced, any existing fauna would temporarily disperse and would likely return to their established territories or habitat, once replacement work on targets is completed, much as they do during the current use of these ranges. As these displacements would be less severe than those associated with the past and ongoing use of these ranges, impacts will be negligible, relative to the No Action Alternative. Established plant species around targetry embankments may actually benefit. The actual impacted area will be small in size and in all likelihood will have been recently and routinely disturbed through simple maintenance of existing range targetry. In all cases, the potential effects of the targetry upgrades are comparable if not less than the effects associated with normal range operations.

Soil erosion can normally be accelerated by construction and military activities, but the effects of the targetry upgrades, given the small acreage involved can be readily mitigated using BMPs, numerous procedures and guidelines to minimize erosion effects from a site.

Any CE impacts to natural resources, geology, and soils will be negligible.

4.13.2 Threatened and Endangered Species
Due to their importance and sensitivity, TES habitats will, as much as practicable, be avoided. If potential impacts are identified, the installation will coordinate with the US Fish and Wildlife Service to determine the magnitude of the potential impacts, as well as potential steps to reduce or eliminate potential impacts on TES, such as mitigations, modification of training, or other required steps. Such impacts would also likely apply to the "no-action" alternative, as existing sites are being used.

While these impacts may be insignificant, even minor effects may require CEA, if potentially affected TES constitute a regionally important VEC. This two overarching questions apply:

> (1) Are their any impacts (even minor) on a given VEC? If TES exist at the site, and mitigations eliminate any impacts, CEA is not required.
>
> (2) Is the VEC regionally significant? If the TES impacts exist, they are likely important in the region, and will likely warrant additional CEA. The installation environmental office can facilitate this determination.

4.13.3 Land Use and Planning
Standard targetry replacement does not alter the land use of training ranges, nor is it a significant factor in the planning of new ranges. Therefore, no CE impacts are anticipated.

4.14.4 Cultural Resources
In rare cases, the operation or maintenance of a range could encounter (and potentially impact) cultural resources, requiring coordination with the installation’s cultural resources staff.

In such cases, both overarching questions apply:

> (1) Are their any impacts (even minor) on a given VEC? If cultural resources exist at the site, and mitigations eliminate any impacts, CEA is not required.
>
> (2) Is the VEC regionally significant? If the cultural resource impacts exist, mitigations may prove sufficient to eliminate the impacts. The installation environmental office can facilitate this determination through coordination with state, federal, and tribal officials if necessary.

4.13.5 Air Quality

The Proposed Action may result in incidental emissions from fugitive dust, and vehicle and generator exhausts; and emissions during training may cause short-term impacts to air quality. Final determinations must be made at the participating installation.

Both overarching questions apply:

(1) Are their any impacts (even minor) on a given VEC? If impacts exist at the site, and mitigations eliminate any impacts, CEA is not required.

(2) Is the VEC regionally significant? If the site is in a non-attainment area, CEA may be required. The installation environmental office can facilitate this determination.

4.13.6 Water Quality

While the Proposed Action should not pose a significant impact to water quality, the installation water program manager will be consulted prior to initiating standard targetry replacement.

Both overarching questions apply:

(1) Are their any impacts (even minor) on a given VEC? If water quality impacts exist at the site, and mitigations eliminate any impacts, CEA is not required.

(2) Is the VEC regionally significant? If these impacts affect a regionally important water body, mitigations may prove sufficient to eliminate the impacts. The installation environmental office can facilitate this determination.

4.13.7 Noise

The Proposed Action takes place within existing ranges. These ranges are typically located in areas that are along installation boundaries or adjacent to surrounding communities. The actual replacement of standard targetry should not create noise levels significantly above 75 decibels, or roughly the sound of busy traffic 5 meters away. Since, as a safety precaution and standard procedure, the range is off-limits to training activities for maintenance purposes, standard targetry replacement will not increase overall installation noise levels should not exceed current noise contours. The Proposed Action does not introduce noisier equipment or munitions than historically used on training ranges. No further CEA is required.

4.13.8 Solid Waste

Metallic range residues that can be recycled for metals recovery are excluded from the definition of “solid waste” as “excluded processed scrap metal [40 CFR 261.4(a)(13)] and therefore cannot be hazardous waste subject to RCRA Subtitle C controls. Figure 2 on the following page demonstrates the regulatory framework. As solid waste disposal from standard targetry replacement is appropriately managed by current initiatives, no further CE analysis is required.

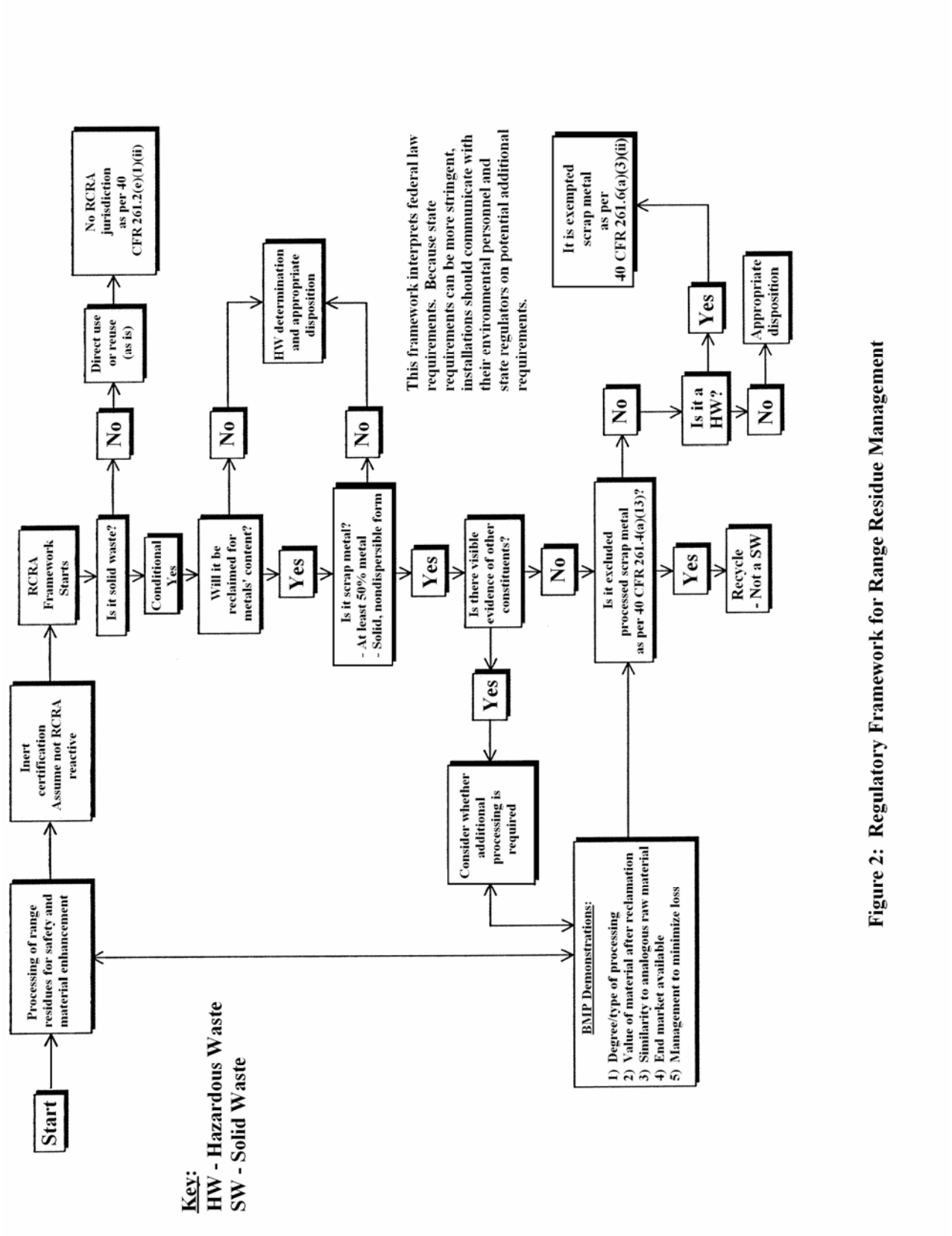

Figure 2: Regulatory Framework for Range Residue Management

4.13.9 Hazardous Materials and Used Oil

The Proposed Action will not result in the creation of additional hazardous wastes beyond what is normally produced as a result of normal range maintenance activities. Any hazardous wastes generated would be disposed of in accordance with local, state, and federal regulations. Installations should adhere to an approved hazardous waste management plan. No CE impacts are anticipated from the disposal of hazardous wastes resulting from standard targetry replacement.

4.13.10 Aesthetic Resources

No CE impacts are anticipated since the Proposed Action takes place on existing ranges. Although some targets may be upgraded with larger or more improved targetry, these targets would not degrade the aesthetic properties or realism of the ranges.

4.13.11 Socioeconomics

No CE impacts to socioeconomics are anticipated as a result of the Proposed Action. The Proposed Action occurs on established training ranges that do not in of themselves constitute any impact on local communities.

4.13.12 Environmental Justice

No CE impacts to environmental justice are anticipated. The Proposed Action takes place on active ranges and these areas are ordinarily placed within an installation's training areas and are off-limits to the general public.

Implementation of either the Proposed Action or the No Action Alternative will not result in a fundamental change to range operations. Given the minor direct and indirect impact implications of targetry replacement, the isolated nature of Army ranges, and very small risk of migrating effects; no further analysis of cumulative effects is required. This determination is consistent with the CEQ guidelines (CEQ, 1997) and current CEA guidelines under Army development (Canter, *et al*, 2005).

5.0 CONCLUSION

Based on a review of the generic levels of impact associated with the Army implementation of the proposed action and given the existing Army management and control systems; the proposed action, implemented properly, will have no significant direct, indirect, or cumulative impact on the human or natural environment. A checklist and REC, attached in Appendix A, can be used to validate and certify the assumptions, analyses, determinations, and stipulations in this PEA.

Once this REC/checklist has been completed and the appropriate determinations have been made, the REC can constitute final statutory and regulatory compliance with NEPA, as well as the provisions in 32 CFR 651. Installation environmental and proponent staff will be able to utilize these screening and evaluation criteria to evaluate targetry replacement procedures, and insure that appropriate steps are being taken to safeguard the environment. The REC signature page certifies that the installation proponent and environmental understands these requirement and is committed to meeting specified technical and economic (or fiscal) requirements.

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8.0 ACRONYMS

AR	Army Regulation
BMPs	Best Management Practices
CE	Cumulative Effect
CEA	Cumulative Effects Analysis
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
CX	Categorical Exclusion
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESMP	Endangered Species Management Plan
F	Degrees Fahrenheit
ft	Feet
FNSI	Finding of No Significant Impact
ICRMP	Integrated Cultural Resources Management Program
INRMP	Integrated Natural Resources Management Plan
ITAM	Integrated Training Area Management
LRAM	Land Rehabilitation and Maintenance
MACOM	Army Major Command
mm/yr	Millimeters per Year
µm	Micrometers
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_x	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
PEA	Programmatic Environmental Assessment
$PM_{2.5}$	Particulate Matter 2.5 Micrometers or Smaller
PM_{10}	Particulate Matter 10 Micrometers or Smaller
PTA	Pōhakuloa Training Area
RCRA	Resource Conservation and Recovery Act
RDP	Range Development Plan
REC	Record of Environmental Consideration
ROI	Region of Influence
RTLP	Range and Training Lands Program
SEA	Supplemental Environmental Assessment
SEIS	Supplemental Environmental Impact Statement
SOPs	Standard Operating Procedures
SPCCP	Spill Prevention Control and Countermeasures Plan
SRP	Sustainable Range Program
TC	Training Circular
T&E	Test and Evaluation
TEPC	Threatened, Endangered, Proposed, or Candidate species
TES	Threatened and Endangered Species
US	United States
USC	United States Code
VECs	Valued Environmental Components
VOCs	Volatile Organic Compounds

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APPENDIX A

REC Checklist and Preliminary Evaluation

This checklist is intended to provide a framework for the identification of any NEPA requirements beyond this PEA for standard Army targetry replacement; and to certify that both the installation staff and the project proponent understand and support the requirements and discussions in this PEA; particularly the site conditions, the proposed action, and required mitigations. If the conditions of this checklist are met, and if procedures and mitigations are adopted at the installation level, a REC may be prepared, referencing this PEA and the project can proceed. If some checklist conditions are not met or accepted, the installation does not adopt the provisions in this PEA, or the installation environmental office finds this PEA inadequate, a separate EA will be required, and will culminate in either a separate FNSI or an NOI to prepare an EIS if significant effects are identified.

The considerations in this PEA and the REC checklist are comprehensive, but may not be sufficiently exhaustive to address specific conditions at every installation. For this reason the local environmental staff must review this PEA, evaluate the checklist conditions and requirements, and determine the appropriate course of action. If an EA is required, it can "supplement" this PEA, addressing only those topics or issues that require further evaluation.

To use the attached checklist to evaluate the proposed range activity, the following format is recommended:

- A checkmark on the REC checklist implies applicability of this PEA
- “N/A” implies that the question does not apply
- The absence of a checkmark implies an issue that may require further NEPA analysis**.**

The “Response Documentation” column may be used by the Environmental Office staff for any comments pertaining to the Proposed Action.

If the installation staff determines that the proposed action does not fit the definition of standard targetry replacement (several items are not checked off), or some aspects of this PEA are inadequate due to local conditions or issues, a REC cannot fulfill NEPA requirements, and further environmental analysis is required.

Any questions regarding completion of this checklist should be directed to the installation environmental staff. This checklist references portions of Title 32, CFR Part 651, "Environmental Analysis of Army Actions".

To: (Environmental Officer) **From: (Proponent)**

Project Title:

Brief Description:

Estimated Date and/or Duration of Proposed Action: (Month/year)

It has been determined that the action (choose one)

Is adequately covered in an existing EA____ EIS____

Title:

Date:

Qualifies for Categorical Exclusion _____ Appendix B, 32 CFR 651.

_____Based on the evaluation criteria below, this proposed action qualifies for a Record of Environmental Consideration because it is covered in a PEA entitled "Programmatic Environmental Assessment for Standard Targetry Replacement" dated June 2005.

The following signatories certify their understanding of this PEA and the analyses in it, and certify compliance with the provisions and mitigations that are presented. This includes the compliance of the procedures (BMPs and SOPs) that are specified, and the funding necessary to insure that the required mitigations will be implemented.

_____ _____

(Proponent) **Environmental Officer**

_____ _____

(Phone Number) **(Phone Number)**

		√ or N/A	Response Documentation
1.	The proposed action is a "one-for-one" replacement in the same locations as existing targetry.		
2.	The proposed action will not replace targetry with targetry in a new location. If targetry replacement involves new location(s), estimate the total affected new area (in acres). (*Note 1*)		
2a.	If targetry replacement involves new location(s), estimate the total affected area in acres (*Note 1*)		
3.	The proposed action will not expand the land area (footprint) of the range. If so, estimate increased footprint (in acres). (*Note 1*)		
4.	The proposed action will not require excavation and trenching. If so, will excavation/trenching be in previously undisturbed soil? (*Note 1*)		
5.	The proposed action will not destroy existing vegetative cover. If so, estimate existing vegetative cover loss (in acres). (*Note 1*)		
6.	The proposed action will not increase volume and/or speed of storm water runoff.		
7.	The proposed action will not increase the amount of impervious surface.		
8.	A storm water permit will not be required at this site.		
9.	The existing targetry does not use hydraulics. If so, is there contamination?		
10.	This site is included in the installation SPCCP.		
11.	The proposed action will not involve the excavation of unexploded ordnance.		
12.	The proposed action has not been "segmented" into smaller parts, in order to avoid the appearance of significant impacts.		
13.	There is no reasonable likelihood of significant effects on public health, safety, or the environment.		
14.	There is no reasonable likelihood of direct, indirect, or cumulative significant environmental effects.		

		√ or N/A	Response Documentation
15.	The potential action involves no uncertain or unique environmental risks.		
16.	The proposed action is the normal scope and size for this category of action.		
17.	At the site of the Proposed Action there are no reportable releases of hazardous or toxic substances (as specified in 40 CFR Part 302, Designation, Reportable Quantities and Notification).		
18.	Air emissions will not likely exceed *de minimis* levels or a formal Clean Air Act conformity determination.		
19.	The site is in an air attainment zone.		
20.	There have been no noise complaints at this range.		
20.	There is no reasonable likelihood of violating any federal, state, local law, or requirements imposed to protect the environment.		
21.	The proposed action will not have an unresolved effect on environmentally sensitive resources.		
22.	The proposed action will not impact federally listed, threatened, or endangered species or their designated critical habitats.		
23.	The proposed action will not affect properties listed (or eligible for listing) on the National Register of Historic Places.		
24.	The proposed action will not impact areas with cultural resources, as defined by AR 200-4.		
25.	The proposed action will not impact areas having special designation or recognition such as: · Prime or unique agricultural lands · Coastal zones · Designated wilderness/wilderness study areas · Wild and scenic rivers · National Historic Landmarks · 100-year floodplains, wetlands, or sole-source aquifers		
26.	The proposed action will not involve highly controversial effects on the quality of the environment.		

		√ or N/A	Response Documentation
27.	The proposed action will not involve effects on the environment that are highly uncertain, involve unique or unknown risks, or are scientifically controversial.		
28.	There is no potential for degradation of area(s) with already existing poor environmental conditions, or area(s) not already significantly modified from their natural conditions.		
29.	The new/replacement target system is a proven technology.		
30.	A Best Management Practices plan has been produced; taking appropriate BMPs and it has been approved by the installation environmental office.		

Note 1: Only include NEW surface disturbance of five acres or more resulting from the proposed action (32 CFR Part 651, Appendix B.II).